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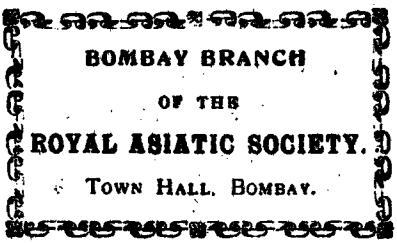

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CYCLOPÆDIA

OF THE

NATURAL SCIENCES.

BY

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BRITISH MUSEUM.

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MAP AND NUMEROUS ILLUSTRATIONS.

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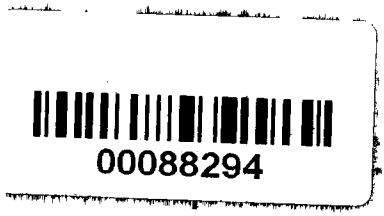

PREFACE

THE Natural Sciences embrace such a multiplicity of objects, that an Alphabetical List of the mere names would alone fill a volume of the same size as the present. My design, therefore, in compiling this Dictionary has been to give a succinct account of the most interesting objects in the ANIMAL, VEGETABLE, and MINERAL KINGDOMS, with an explanation of various terms used by authors in treating of them. It is intended, in fact, to serve as a familiar work of reference to Natural History, and to appear in as condensed a form as could be done, consistently with the object I have always had in view of combining science and instruction with agreeable reading and amusement. All authors of works like the present, will, I think, agree that the labour of selecting and condensing is infinitely greater than amplifying and enlarging.

In some things this work differs from most of its predecessors in the manner in which it is constructed.

First, I have in the body of the work adopted only the scientific names for the objects mentioned, and have thrown the familiar and common English names into an Index at the end. Thus, for instance, a reader wishing to obtain some information about the *Dog* or the *Horse* will have to apply to the English Index for these words, where he will find he is referred to the articles *Canidæ* and *Equidæ* for the information required. In the same Index he will find an explanation of various English terms used in the Natural Sciences.

Secondly, I have introduced to some extent the subject of Teratology, or the study of the abnormal forms of animals, or, as they are commonly called, *monsters*. A knowledge of these deviations from nature is of great use in the study of Zoology. In the present edition, I have confined myself to this subject in reference to the Animal Kingdom, as the application of it to Botany would have caused a considerable increase to the size of this volume, which has already exceeded the space originally allowed me.

Thirdly, A Map has been introduced, showing the distribution of animals over the globe. Being rather on a small scale, only the more important animals are pointed out, as a multitude of names introduced would only render the Map difficult to be read with ease and distinctness. It is to be hoped it will be deemed by the readers of this

Dictionary an important feature of the work, and may be considered as only a commencement of a series of similar charts.

Prefixed is a tabular view of the general arrangement of the Animal and Vegetable Kingdoms. The limited space necessarily allowed for this purpose, compels me to give merely a very brief outline of such an arrangement.

The Illustrations introduced in the body of the volume, are either original engravings made expressly for this work, or are such as have been placed at the author's disposal by the Publishers. The names of HARVEY, and DALZIELL BROTHERS, are guarantees for the correctness and elegance of such as have been done by them; whilst many of the others, executed by the MISSES SHELDRICK and DUNLOP, have been taken from original sources, and engraved with care and fidelity.

Though the authorities for the statements made are seldom given in the various articles of which this Dictionary is composed, yet the information may be relied upon as having been in all cases derived from the most authentic sources.

W. BAIRD.

BAYSWATER, *January* 1858.

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TABULAR VIEW

OF THE

ARRANGEMENT OF THE ANIMAL AND VEGETABLE KINGDOMS.

KINGDOM ANIMALIA—Animals.

Sub-Kingdom I.—Vertebrata—*Vertebrated Animals.*

CLASS I.—MAMMALIA—*Mammals* or *Quadrupeds.* (Dr. Gray's Arrangement.)

ORDER I.—PRIMATES
- Family 1. Hominidæ—*Man.*
- — 2. Simiidæ—*Monkeys of the Old World.*
- — 3. Cebidæ—*Monkeys of the New World.*
- — 4. Lemuridæ—*Lemurs.*
- — 5. Galeopithecidæ—*Flying Lemurs* or *Colugos*
- — 6. Vespertilionidæ—*Bats.*

ORDER II.—FERÆ—*Rapacious Beasts.*
- Family 1. Feldiæ—*Cat Family.*
- — 2. Ursidæ—*Bears.*
- — 3. Talpidæ—*Moles.*
- — 4. Macropidæ—*Kangaroos.*
- — 5. Phocidæ—*Seals.*

ORDER III.—CETE—*Whales.*
- Family 1. Balænidæ—*True Whales.*
- — 2. Delphinidæ—*Dolphins.*
- — 3. Manatidæ—*Manatees.*
- — 4. Halichoridæ—*Dugongs.*
- — 5. Rytinidæ—*Stellerines.*

ORDER IV.—GLIRES—*Rodent Animals.*
- Family 1. Muridæ—*Mice.*
- — 2. Hystricidæ—*Porcupines.*
- — 3. Leporidæ—*Hares.*
- — 4. Jerboidæ—*Jerboas.*
- — 5. Aspalacidæ—*Mole-Rats.*

ORDER V.—UNGULATA—*Hoofed Beasts.*
- Family 1. Bovidæ—*Ruminant Animals.*
- — 2. Equidæ—*Horses.*
- — 3. Elephantidæ—*Elephants.*
- — 4. Dasypidæ—*Armadillos.*
- — 5. Bradypidæ—*Sloths.*

CLASS II.—AVES—*Birds.* (Mr. G. R. Gray's Arrangement.)

ORDER I.—ACCIPITRES—*Rapacious Birds.*

A.—Accipitres Diurni.

Family 1. Gypaëtidæ—*Lammergeyer, &c.*
— 2. Vulturidæ—*Vultures.*
— 3. Falconidæ—*Falcons.*
— 4. Serpenteriidæ—*Secretary Birds.*

B.—Accipitres Nocturni.

Family 1. Strigidæ—*Owls.*

ORDER II.—PASSERES—*Perching Birds.*

A.—Fissirostres.

Family 1. Caprimulgidæ—*Goat-Suckers.*
— 2. Hirundinidæ—*Swallows.*
— 3. Coraciidæ—*Rollers.*
— 4. Trogonidæ—*Trogons.*
— 5. Alcedinidæ—*King-fishers.*
— 6. Meropidæ—*Bee-eaters.*

B.—Tenuirostres.

Family 1. Upupidæ—*Hoopoes.*
— 2. Promeropidæ—*Sun-birds.*
— 3. Trochilidæ—*Humming Birds.*
— 4. Meliphagidæ—*Honey-eaters.*
— 5. Certhiidæ—*Creepers.*

C.—Dentirostres.

Family 1. Luscinidæ—*Warblers.*
— 2. Turdidæ—*Thrushes.*
— 3. Muscicapidæ—*Fly-catchers.*
— 4. Ampelidæ—*Chatterers.*
— 5. Laniidæ—*Butcher Birds.*

D.—Conirostres.

Family 1. Corvidæ—*Crows.*
— 2. Paradisidæ—*Birds of Paradise.*
— 3. Sturnidæ—*Starlings.*
— 4. Fringillidæ—*Finches.*
— 5. Musophagidæ—*Plantain-eaters.*
— 6. Buceridæ—*Hornbills.*

ORDER III.—SCANSORES—*Climbers.*

Family 1. Ramphastidæ—*Toucans.*
— 2. Psittacidæ—*Parrots.*
— 3. Picidæ—*Woodpeckers.*
— 4. Cuculidæ—*Cuckoos.*

ORDER IV.—COLUMBÆ—*Pigeons.*

Family 1. Columbidæ—*Doves* and *Pigeons.*

ORDER V.—GALLINÆ—*Gallinaceous* or *Game Birds.*

Family 1. Pteroclidæ—
— 2. Cracidæ—*Curassows.*
— 3. Megapodidæ—*Mound Birds.*
— 4. Phasianidæ—*Pheasants.*
— 5. Tetraonidæ—*Grouse.*
— 6. Chionididæ—*Sheathbills.*
— 7. Tinamidæ—*Tinamous.*

ORDER VI.—STRUTHIONES—*Struthious Birds.*

Family 1. Struthionidæ—*Ostriches.*
— 2. Apterygidæ—*Ki-wis.*

ORDER VII.—GRALLÆ—*Waders.*
Family 1. Otididæ—*Bustards.*
— 2. Charadriidæ—*Plovers.*
— 3. Gruidæ—*Cranes.*
— 4. Ardeidæ—*Herons.*
— 5. Scolopacidæ—*Snipes.*
— 6. Palamadeidæ—*Screamers.*
— 7. Rallidæ—*Rails.*

ORDER VIII.—ANSERES—*Aquatic Birds.*
Family 1. Anatidæ—*Ducks.*
— 2. Colymbidæ—*Divers.*
— 3. Alcidæ—*Auks.*
— 4. Procellariidæ—*Petrels.*
— 5. Laridæ—*Gulls.*
— 6. Pelecanidæ—*Pelicans.*

CLASS III.—REPTILIA—*Reptiles.* (Dr. Gray's Arrangement.)

A.—SQUAMATA—*Scaly Reptiles.*

ORDER I.—SAURA—*Lizards.*

SUB-ORDER I.—LEPTOGLOSSÆ—*Slender-tongued Lizards.*
A.—*Cyclosaura.*
Contains 10 Families.
B.—*Geissosaura.*
Contains 10 Families

SUB-ORDER II.—PACHYGLOSSÆ—*Thick-tongued Lizards.*
A.—*Nyctisaura.*
Contains 1 Family.
B.—*Strobilosaura.*
Contains 2 Families.
C.—*Dendrosaura.*
Contains 1 Family.

ORDER II.—OPHIDIA—*Snakes.*

SUB-ORDER I.—VIPERINA—*Rattlesnakes* and *Vipers.*
Contains 3 Families.

SUB-ORDER II.—COLUBRINA—*Water Snakes* and *Boas.*
Contains 2 Families.

B.—CATAPHRACTA—*Shielded Reptiles.*

ORDER I.—CHELONIA—*Turtles* and *Tortoises.*
Contains 5 Families.

ORDER II.—EMYDOSAURI—*Crocodiles* and *Alligators.*
Contains 3 Families.

ORDER III.—AMPHISBÆNIA—*Amphisbænians.*
Contains 4 Families.

CLASS IV.—AMPHIBIA—*Amphibious Animals.*

ORDER I.—BATRACHIA—*Batrachians.*
A.—Anoura or Salientia—*Tail-less Batrachians.*
Contains 4 Families.
B.—Gradientia or Urodela—*Tailed Batrachians.*
Contains 3 Families.

ORDER II.—PSEUDOSAURIA—*Gill-less Amphibians.*
Contains 2 Families.

ORDER III.—PSEUDOPHIBIA—*Anguiform Amphibians.*
Contains 1 Family.

ORDER IV.—PSEUDOICHTHYAS—*Lepidosirens.*
Contains 1 Family.

ORDER V.—MEANTIA—*Sirens.*
Contains 2 Families.

CLASS V.—PISCES—*Fishes.* (Sir J. Richardson's Arrangement.)

ORDER I.—DERMOPTERI—*Suctorial Fishes.*
Contains 5 Families.

ORDER II.—MALACOPTERYGII—*Soft-finned Fishes.*
A.—Apodes Anguiformes—*Serpentiform Apodals.*
Contains 5 Families.
B.—Apodes Anthropterygii.
Contains 1 Family.
C.—Abdominales—*Abdominal Soft-finned Fishes.*
Contains 19 Families.

ORDER III.—PHARYNGOGNATHI—*Pharyngeal Fishes.*
A.—Malacopterygii—*Soft-finned Pharyngeals.*
Contains 1 Family.
B.—Acanthopterygii—*Spiny-finned Pharyngeals.*
Contains 4 Families.

ORDER IV.—ANACANTHINI—*Spineless Fishes.*
A.—Apodes—*Apodal Spineless Fishes.*
Contains 1 Family.
B.—Thoracici—*Thoracic Spineless Fishes.*
Contains 4 Families.

ORDER V.—ACANTHOPTERI—*Spiny Fishes.*
Contains 24 Families.

ORDER VI.—PLECTOGNATHI—*Soldered-jaw Fishes.*
Contains 3 Families.

ORDER VII.—LOPHOBRANCHII—*Tufted-gill Fishes.*
Contains 3 Families.

ORDER VIII.—GANOIDEI—*Ganoid Fishes.*
Contains 4 Families.

ORDER IX.—PROTOPTERI—*Amphibian Fishes.**
Contains 1 Family.

ORDER X.—HOLOCEPHALI—*False Sharks.*
Contains 1 Family.

ORDER XI.—PLAGIOSTOMI—*Wide-mouthed Fishes.*
A.—Squali—*Sharks.*
Contains 12 Families.
B.—Raiæ—*Rays.*
Contains 7 Families.

Sub-Kingdom II.—Mollusca—*Molluscous Animals*

CLASS I.—GASTEROPODA—*Gasteropods* or *Univalves.*

A.—Ctenobranchiata.
Contains most of the Marine Univalve-shelled Mollusca.
B.—Heterobranchiata.
Contains the Nudibranchiate Mollusca and most of the land and fresh water Snails.

* Equivalent to part of the Order PSEUDOICHTHYAS of Gray, in the Class REPTILIA.

CLASS II.—CONCHIFERA—*Bivalve-shelled Mollusca*

A.—Dimyaria—*Bimuscular Bivalves.*
Contains the greater number of the Bivalve-shelled Mollusca.

B.—Monomyaria—*Unimuscular Bivalves.*
Contains the Scallops and Oysters, &c.

CLASS III.—BRACHIOPODA—*Lamp Shells.*
Contains the Terebratulæ, &c.

CLASS IV.—PTEROPODA—*Pteropods.*
Contains the Glass-chariot Shells, Clio, &c.

CLASS V.—CEPHALOPODA—*Cuttle-fish.*

A.—Dibranchiata.
Contains the Octopods, as the Argonauts, &c., and the Decapods, as the true Cuttle-fishes, Squids, &c.

B.—Tetrabranchiata.
Contains the Nautili, Ammonites, &c.

CLASS VI.—TUNICATA—*The Tunicaries*
Contains the Ascidians, Salpæ, &c.

Sub-Kingdom III.—Annulosa or Articulata—*Annulose* or *Articulated Animals.*

CLASS I.—INSECTA—*Insects.* (Mr. Westwood's Arrangement.)

ORDER I.—COLEOPTERA—*Beetles.*
A.—Pentamera—(all the tarsi five-jointed.)
Contains 44 Families.
B.—Heteromera—(four anterior tarsi five-jointed, two posterior four-jointed.)
Contains 15 Families.
C.—Pseudotetramera—(all the tarsi five-jointed, but the fourth exceedingly small.)
Contains 11 Families.
D.—Pseudotrimera—(the tarsi four-jointed, the third exceedingly small.)
Contains 3 Families.

ORDER II.—EUPLEXOPTERA—*Earwigs.*
Contains 1 Family.

ORDER III.—ORTHOPTERA—*Orthopterous Insects.*
Contains 6 Families.

ORDER IV.—THYSANOPTERA—*Thrips Insects.*
Contains 1 Family.

ORDER V.—NEUROPTERA—*Neuropterous Insects.*
Contains 11 Families.

ORDER VI.—TRICHOPTERA—*Caddice-flies.*
Contains 1 Family.

ORDER VII.—HYMENOPTERA—*Hymenopterous Insects.*
Contains 19 Families.

ORDER VIII.—STREPSIPTERA—*Bee Parasites.*
Contains 1 Family.

ORDER IX.—LEPIDOPTERA—*Butterflies* and *Moths.*
A.—Rhopalocera—*Butterflies.*
Contains 6 Families.
B.—Heterocera—*Moths.*
Contains 15 Families

ORDER X.—HOMOPTERA—*Homopterous Insects.*
A.—Trimera—(tarsi three-jointed, &c.)
Contains 3 Families.
B.—Dimera—(tarsi two-jointed.)
Contains 3 Families.
C.—Monomera—(tarsi one-jointed.)
Contains 1 Family.

ORDER XI.—HETEROPTERA (=HEMIPTERA)—*Hemipterous Insects*, or *Bugs.*
A.—Hydrochorisa—*Water Bugs.*
Contains 2 Families.
B.—Aurocorisa—*Land Bugs.*
Contains 10 Families.

ORDER XII.—APHANIPTERA—*Fleas.*
Contains 1 Family.

ORDER XIII.—DIPTERA—*Two-winged Insects.*
A.—Nemocera.
Contains 2 Families.
B.—Brachocera.
Contains 20 Families.
C.—Pupipara.
Contains 2 Families.

ORDER XIV.—ANOPLURA—*Parasites.*
— XV.—THYSANURA—*Fringe-tails.*

CLASS II.—ARACHNIDA—*Spiders.*

ORDER I.—PYCNOGONIDÆ—*Sea Spiders.*
— II.—TARDIGRADA—*Water Bears.*
— III.—ACARIDÆ—*Mites.*
— IV.—PHALANGIDÆ—*Shepherd Spiders.*
— V.—PSEUDOSCORPIONIDÆ—*Chelifers*, or *Book Scorpions.*
— VI.—SOLPHUGIDÆ.
— VII.—PEDIPALPI—*Scorpions.*
— VIII.—ARANEIDÆ—*True Spiders.*

CLASS III.—MYRIAPODA—*Myriapods*

A.—Chilopoda—*Centipedes, &c.*
B.—Chilognatha—*Millipedes.*

CLASS IV.—CRUSTACEA—*Crustaceans.* (M. Edwards's Arrangement.)

(MALACOSTRACA.)

A.—PODOPTHALMA—*Stalk-eyed Crustaceans.*
ORDER I.—DECAPODA—*Crabs, Lobsters, &c.*
— II.—STOMAPODA—*Glassy* and *Mantis Shrimps.*

B.—EDRIOPTHALMA—*Sessile-eyed Crustacea.*
ORDER III.—AMPHIPODA—*Gammari, Screws, &c.*
— IV.—ISOPODA—*Hog-lice, Slaters, &c.*
— V.—LÆMODIPODA—*Spectre Shrimp* and *Whale-louse.*

C.—TRILOBITES—*Fossil.*

(ENTOMOSTRACA.)

D.—BRANCHIOPODA.
ORDER VI.—PHYLLOPODA.
— VII.—CLADOCERA.

E.—LOPHYROPODA.
ORDER VIII.—OSTRACODA.
— IX.—COPEPODA.

F.—Pæcilopoda
Order X.—Siphonostoma
— XI.—Lerneidæ
— XII.—Pycnogonidæ
(Xyphosuria.)
Order XIII.—Xyphosura*

CLASS V.—CIRRIPEDIA—*Barnacle Shells.*

CLASS VI.—ANNELIDA or ANNULATA—*Annelides.*
(Siebold.)
Order I.—Apoda—*Body without Bristles.*
A.—Memertini—*Body without a Sucker.*
B.—Hirudinei—*Body provided with a Sucker.*
Order II.—Chætopoda—*Body provided with Bristles.*
C.—Lumbricini—*Earth Worms, &c.*
D.—Capitibranchiati—*Animals mostly enclosed in a tube.*
E.—Dorsibranchiati—*Nereids, Lob-worms, &c.*

CLASS VII.—ROTATORIA—*Rotifers*

CLASS VIII.—TURBELLARIA—*Planarias.*

CLASS IX.—ENTOZOA—*Intestinal Worms.*
Order I.—Nematoidea—*Round Worms.*
— II.—Acanthotheca
— III.—Trematoda—*Flukes, &c.*
— IV.—Acanthocephali
— V.—Cestoidea—*Cestoid* and *Encysted Worms.*

CLASS X.—ECHINODERMATA—*Echinoderms.*
Order I.—Crinoidea
— II.—Asteroidea—*Star-fishes.*
— III.—Echinoidea—*Sea Urchins.*
— IV.—Holothurioidea—*Holothurians.*
— V.—Sipunculoidea—*Sipunculi.*

CLASS XI.—ACALEPHÆ—*Acalephs.*
Order I.—Siphonophora—*Diphyids, Portuguese men-of-war, &c.*
— II.—Discophora—*Medusæ, &c.*
— III.—Ctenophora—*Beroes, &c.*

CLASS XII.—ZOOPHYTA or POLYPI—*Zoophytes.*
Order I.—Anthozoa—*Radiated Zoophytes.*
— II.—Bryozoa—*Molluscan Zoophytes.*

CLASS XIII.—PROTOZOA
Order I.—Infusoria—*Infusory Animalcules.*
— II.—Rhizopoda—*Foraminifers, &c.*

CLASS XIV.—SPONGIA—*Sponges.*

KINGDOM VEGETABILIA—The Vegetable Kingdom.

(Balfour's Arrangement.)

Section I.—Phanerogamia—*Vascular Flowering Plants.*

CLASS I.—DICOTYLEDONES OR EXOGENÆ—*Dicotyledonous* or *Exogenous Plants.*

SUB-CLASS I.—THALAMIFLORÆ—*Plants whose flowers have five petals inserted upon the receptacle on the same level as the ovary.*
Contains 60 natural Families.

SUB-CLASS II.—CALYCIFLORÆ—*Plants whose flowers are inserted upon the tube of the calux.*
Contains 39 natural Families.

SUB-CLASS III.—COROLLIFLORÆ—*Plants whose flowers have the petals united, and are inserted upon the receptacle on a level with the ovary.*
Contains 143 natural Families.

SUB-CLASS IV.—MONOCHLAMYDEÆ—*Plants in which the corolla is wanting.*
A.—Angiospermæ—*Plants which have their seeds enclosed in a vessel or pericarp.*
Contains 36 natural Families.
B.—Gymnospermæ—*Plants which have the seeds naked, or not contained in a pericarp.*
Contains only 2 natural Families.

CLASS II.—MONOCOTYLEDONES OR ENDOGENÆ—*Monocotyledonous* or *Endogenous Plants.*

SUB-CLASS I.—DICTYOGENÆ—*Endogenous Plants with netted or reticulated leaves.*
Contains 3 natural Families.

SUB-CLASS II.—PETALOIDEI—*Plants with coloured sepals or calyx.*
Contains 25 natural Families.

SUB-CLASS III.—GLUMACEÆ—*Plants whose flowers are enclosed within sterile bracts or glumes.*
Contains 2 Families.

Section II.—Cryptogamia—*Cryptogamous Plants.*

CLASS III.—ACOTYLEDONES—*Acotyledonous Plants.*

SUB-CLASS I.—ACROGENÆ or CORMOGENÆ—*Plants which increase only by the summit.*
Contains 6 natural Families.

SUB-CLASS II.—THALLOGENÆ or CELLULARES—*Plants bearing a thallus or frond.*
Contains 3 natural Families.

DICTIONARY

OF THE

NATURAL SCIENCES.

Abdomen (*abdo*, I hide).—A portion of the body of an animal, which is generally described as a cavity containing the organs of digestion and secretion, &c. In man and other mammalia it is separated, above, from the chest or thorax by a strong muscle called the diaphragm, is bounded below by the bones of the pelvis or basin, and behind by the spine. In insects and crustacea, the term is used to designate the whole portion of the body behind the corselet or thorax, to which it is either intimately joined, or is united by a thread more or less long and narrow; and includes the back as well as the belly. It generally contains a portion at least of the intestines and organs of generation, and affords in many instances good specific characters. In insects it is covered by the wings and wing cases (*elytra*), and consists of a number of segments or rings, upon the sides of which are found small openings called *stigmata*, by which the animals breathe. There are no locomotive organs attached to those segments.

Abdominales.—A division of fishes belonging to the order *Malacopterygii*, or soft fins; which are characterized by their having the ventral (*abdominal*) fins situated behind the pectorals. The greater part of the fresh water fishes are contained in this division, such as the carps (CYPRINIDÆ), the pikes (ESOCIDÆ), silures (SILURIDÆ), and the salmons (SALMONIDÆ); the herrings (CLUPEIDÆ) also belong to it. See these words. The importance in a commercial point of view, of many of these fishes, is very great.

Aberdevine, the *Siskin*.—A well-known singing bird. See FRINGILLIDÆ.

Abies, the *Fir*.—A genus of dicotyledonous plants belonging to the nat. ord. *Coniferæ*. It differs from the genus *Pinus*, in the scales of the cone being smooth and attenuated, and the leaves being either fascicled or solitary. All the species are trees of various sizes, usually with a straight, conical, undivided trunk, from which proceed spreading, horizontal, or drooping branches arranged in a pyramidal form. Most of them are interesting from the excellence of their wood, their products, and their ornamental character. The silver fir, *A. picea* (=*Picea pectinata*), is a native of the mountains of the middle or south of Europe, often growing to the height of from 130 to 150 feet. The leaves have the points turned up to the sky, and are mealy underneath; and the cones are long, erect, and stalkless. The wood is soft, and the tree yields Burgundy pitch and Strasburg turpentine. The spruce fir, *A. excelsa*, is a native of the mountainous parts of the north of Europe, forming in some countries, as Norway, the principal timber. It is a beautiful tree when growing separated from others, with its long drooping branches touching the very ground, and its tall stem rising in a regular pyramid to the height of 150 feet. In commerce, the wood is known under the name of white or Christiania deal. The larch, *A. larix* (=*Larix europæa*), is a native of the mountains of the middle of Europe, Russia, and Siberia, in which latter country it forms vast forests. It grows very erect, with graceful drooping branches, and assumes a regular pyramidal form. It is of very rapid growth, and supplies excellent timber. The bark is useful to tanners. The substance called Venice turpentine is obtained abundantly from the tree when the trunk is wounded; and a sort of manna, called Briançon manna, exudes from the leaves in the form of a white flocculent substance, which concretes into small lumps. The cedar of Lebanon, *A. cedrus* (= *Cedrus Libani*), is a native of Mount Lebanon, and the range of Mount Taurus; and though not a tall tree, is stately and magnificent from its huge and spreading arms, each

of which is almost a tree of itself. The "Cedars of Lebanon" are now few in number on that mountain; the largest of them is upwards of thirty-two

The Cedar of Lebanon.

feet in circumference. They are still held in great veneration, however, and a holiday is set apart for the "Feast of Cedars." Cedar wood is said to be very indestructible. An instance of this is mentioned by Mr. Layard. In the ruins of Nimroud, the Arabs had dug out a beam of cedar wood, and had made a fire of it to warm themselves. Though on a distant part of the mound, he smelt the sweet scent of the wood, which, felled 3,000 years before, had still retained its original fragrance. The sacred Indian fir, *A. Deodara* (= *Cedrus Deodara*), a native of the mountains of Thibet and Nepaul, at a height of 10,000 or 12,000 feet, resembles in general appearance the cedar of Lebanon, and grows to a considerable size. The Indians call it the *Devadara* or *God Tree*, and hold it in veneration. The wood is very durable, spars having been taken uninjured out of Indian temples, known to have been erected from 200 to 400 years. It is so resinous, too, that laths made of it are used as candles. It is now being extensively and successfully cultivated in England. Many other species of the genus *Abies* occur, especially in North America, some of them both useful and ornamental. *A. balsamea*, the Balm of Gilead fir, is a native of the coldest parts of North America. It is a small, slender tree about forty feet high, and its bark contains numerous small cysts from which a clear, transparent, greenish-yellow turpentine flows, known by the name of Canadian Balsam. *A. nigra*, the black spruce fir, is another tree indigenous to the most inclement portions of North America, especially in swampy situations. It is a finer tree than the last, reaching to a height of from seventy to eighty feet, with a diameter of from fifteen to twenty inches, the trunk diminishing with perfect regularity from the base upwards, and terminating in a head of a regular pyramidal form, the branches spreading horizontally. The wood is not of very great value, but it is from the young branches of this tree that the essence of spruce is obtained, so well known as an antiscorbutic in long voyages. *A. Douglasii*, the Douglas fir, a native of the forests of N. W. America, is a noble tree, growing upwards of 180 feet high The wood is good, being heavy, firm, and not liable to warp. It is now being successfully cultivated in this country, appears to suit the climate well, and promises to prove as valuable as the larch itself.

Ablepharus (*αβλεφαρος*, without eyelids).—A genus of reptiles belonging to the family *Scincidæ*. The species are harmless little creatures, living much in the same manner as our lizards. The chief thing remarkable about them is, the wide range of habitat which two species enjoy. One, *A. Kitaibel*, is found in Hungary, in the Morea, and New Holland. The other, *A. Peronii*, occurs in the Morea, New Holland, the Isle of France, Java, and throughout almost the whole of Oceania.

Abramis, the *Bream*.—See CYPRINIDÆ.

Abroma (*α*, priv.; *βρωμα*, food).—A genus of plants. See BYTTNERIACEÆ.

Abrus (*αβρος*, soft).—A genus of papilionaceous plants, belonging to the nat. ord. *Leguminosæ*. There is but one species, *A. precatorius*, a native of India, but found also in the tropical parts of Africa, and in the West Indies. It is a delicate twining shrub, with abruptly pinnate leaves. The leaflets have a strong taste of liquorice, and the plant is called in the West Indies, "Jamaica wild liquorice." The legume is oblong, compressed, and contains from four to six seeds, which vary in colour. In the common variety they are about the size of a small pea, and are bright red, with a jet black spot. These are in great request amongst the natives of the countries where they grow as ornaments; and in Roman Catholic countries are much used as beads for rosaries—whence the specific name.

Abuta.—A genus of climbing plants belonging to the nat. ord. *Menispermaceæ*. Two species, *A. rufescens*, and *A. candicans*, are natives of Guiana, and are used there medicinally under the name of Red and White Pareira-Brava.

Abutilon (*αβυτιλον*, mulberry).—A genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*. The species are numerous, handsome, and resemble the mulberry. One, *A. esculentum*, is called in Brazil, Bencao de Dios, and its large purple flowers are dressed and eaten with their food by the inhabitants of Rio de Janeiro.

Acacia.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The species are numerous, amounting to about 300, all of them shrubs or trees, inhabiting the tropical parts of both Old and New World, and abundant over the whole of Australia. They vary much in the structure of the leaves and flowers. Some have true leaves, which are pinnated in various degrees. Of these about 200 species are known, amongst which the catechu tree, *A. catechu*, may be mentioned; a tree with a tolerably high and stout stem, growing in

mountainous places in the East Indies, and yielding, by decoction from its unripe pods and inner wood, one of the kinds of catechu used in medicine as a powerful astringent, and which, from its containing much *tannin*, is used for tanning. The gum arabic tree, *A. arabica*, is another species of this division; a tree thirteen or fourteen feet high, of rather inelegant appearance, and growing in the East Indies, Arabia, and Abyssinia. The bark when wounded gives out a sap which hardens upon exposure to the air into transparent lumps, and is known in commerce as *Gum Arabic*. A tree called the *Mezquite* tree, and said to be a kind of *Acacia*, has lately been discovered in the north of Texas, towards Arkansas, and in the state of New Mexico, from which gum has been procured equal to that imported from the East. It exudes spontaneously in a semi-fluid state from the bark of the trunk and branches, soon becoming hard, and it may be collected in inexhaustible quantities. The wattle of Australia, *A. discolor*, belongs here also, the bark of which is very astringent, and an extract from it is brought to this country for the purpose of tanning. Other species of acacia have the leaves pinnate only when young, and are remarkable for the petiole or leaf-stalk being developed into the form of what is called a *phyllodium* when they are old. Of these about 100 species are known, most of them natives of Australia. Many are ornamental shrubs, but are not useful in commerce. The flowers of a species of acacia are used by the Chinese in making that yellow which we see bears washing so well, in their silks and stuffs, and which appears with so much elegance in their paintings on paper. The flowers, before they are fully open, are exposed to a gentle heat over a fire for some time; they are then boiled with a little water till it becomes thick and yellow. To this liquor, coarsely strained, some alum and finely powdered oyster shells are added, and all well mixed together.

Acalephæ (*ακαλήφη*, a nettle). *Sea Nettles.* —A class of marine invertebrate animals, of which the medusæ may be taken as the type. The body of the acalephæ is composed of a transparent gelatinous substance composed of polyhedral cells. The quantity of solid matter in them is very small, for if we take a medusa out of the water, and lay it on a board or dry stone, it deliquesces very rapidly. An animal, weighing fifty ounces when taken out of the sea, has been found in no great length of time to leave nothing behind but a little dry cellular tissue, weighing no more than five or six grains. They are from this structure often called Jelly fishes. Their organs are arranged in ray-like processes, radiating from a common centre or a longitudinal axis, in which are lodged the digestive organs. They are elegant pellucid beings, floating on or near the surface of the water, of varied hues and diverse forms; frequently of considerable dimensions, but more often of minute size, and only rendered obvious by their phosphorescent properties. They are surrounded by a very delicate epidermis; and on the arms, tentacles, and other parts of the body, there exist peculiar organs, which produce, when handled, a stinging sensation like that of nettles. These *nettling* organs, as they have been called, are generally composed of an oval capsule, containing a spirally coiled filament, which is suddenly thrown out upon the least disturbance. This has been compared to the *lasso*, used by the natives of South America to catch wild horses, &c. Upon this lasso-like filament a number of barbules are arranged in regular spiral rows, extending to the very extremity, and all pointing backwards, when it is projected. From this stinging property possessed by them, they have derived the name of *Sea Nettle*. The acalephæ possess a muscular system, a nervous system, and a distinct digestive apparatus. Their food consists of small fishes and marine animals. Their circulatory system is less distinct, but it exists, though the system is not regular, but depends upon the irregular contraction of various parts of the body. Their respiratory system is more distinct, however, as the whole body is traversed with canals lined with a delicate ciliated epithelium. Some of the acalephæ are hermaphrodite or bisexual, while others are of one sex alone. They are propagated by eggs, and according to the plan of the alternation of generations. The eggs produce a series of young which at first resemble infusoria. These become fixed and assume a polype-like form, which give birth by gemmation to a new progeny, which ultimately assumes the original form. See ALTERNATION OF GENERATIONS. They also multiply their kind by gemmation alone, little ones springing out almost ready made from the substance of their parents, chiefly from the walls of the peduncle, or from the surface of the ovaries, and closely resembling the parent animal from which they spring. A great portion, if not all, of the acalephæ possess the power of emitting a phosphorescent light in the dark—the smaller species giving out bright sparks of light, while the larger medusæ appear like globes of fire. They are now generally arranged in four orders; the classification being based upon the mode of locomotion peculiar to the different tribes. The first order is that of the *Discophora*, or *Pulmograda*. The motion of these animals is effected by means of a powerful contraction of the body, by which the water contained in its hollow is expelled. By such alternate contractions and dilatations of the body they are enabled to propel themselves with tolerable rapidity. The species properly termed medusæ, and generally known by that name, are contained in this order. See MEDUSA. The second order is that of the *Ctenophora*, or *Ciliograda*. The motion of the animals of this order is effected by means of numerous small vibratile cilia, disposed in rows upon the sides of the body. The family of beroes

is contained in it. See BEROE. Here belongs also the curious genus *Cestum*, which consists of a very short, free, gelatinous body, which is prolonged on each side into a long riband-like appendage, having one of the sides furnished with two rows of vibratile cilia. It is generally called the girdle of Venus, *C. veneris*, and is found in the Mediterranean. It is highly phosphorescent, five or six feet in length, and appears, in a calm dark night, like a long luminous snake, as it is seen floating along the surface of the water. The third order is the *Cirrhigrada*. The body in these animals is almost membranous, oval, or circular in shape, supported by an internal, sub-cartilaginous part; and their organs of locomotion consist of numerous extensile tentacular cirrhi, pendent from the whole of the under surface. The *Velellæ* have on the upper surface of their membranous body a vertical, oblique crest, which acts like a little lateen sail. Some of the species are of a lovely blue colour, and are often met with far at sea, huddled together, young and old, in considerable masses. The *Porpitæ* are circular in shape; the membranous body is concave below, and its lower surface is furnished with numerous cirrhi, the external of which are provided with short cilia. The *P. gigantea*, from the Mediterranean and other warmer seas, is of a beautiful blue colour, with its tentacula purple. The *P. Linneana*, with its numerous suctorial tentacula, is described as a wonderfully beautiful animal, which is found swimming, or rather floating, on the serene surface of the Carribean sea in calm weather, and seizing its prey by suddenly extending downwards some of its arms and embracing its victims. The fourth order is the *Physograda*, which are characterized by their possessing one or more vessels filled with air, by means of which they keep themselves suspended in the water, and by their being furnished with more or less numerous cirrhiform tentacula. See PHYSALIA and DIPHYIDÆ.

Acanthaceæ (*ακανθα*, a thorn).—An order of plants belonging to the monopetalous dicotyledones. There are many genera, and about 750 species are described, but few that are very interesting; some are mere weeds, but others are handsome greenhouse plants; and a few possess medicinal qualities, as emollients or diuretics. They are herbaceous plants, or shrubs, and abound in most tropical countries. Some of the species of the genera *Justicia*, *Ruellia*, and *Aphelandra*, are cultivated in our hothouses for their showy flowers. The seeds of *Acanthodium spicatum* are remarkable for the beautiful spiral cells they have in their episperms or coats, and the style of *Ruellia ciliosophylla* exhibits a peculiar degree of irritability. The type of the order is ACANTHUS—which see.

Acanthocephala (*ακανθα*, a spine; *κεφαλη*, head).—A genus of intestinal worms. See ENTOZOA.

Acanthochites (*ακανθα*, a thorn; *χαιτη*, a bristle).—A genus of mollusca. See CHITONIDÆ.

Acanthodium.—A genus of plants. See ACANTHACEÆ.

Acanthomys (*ακανθα*, a spine; *μυς*, a rat).—A genus of mice. See MURIDÆ.

Acanthophis (*ακανθα*, a thorn; *οφις*, a snake).—A genus of serpents remarkable for their venomous qualities. The mouth is capable of great extension, and besides the retractile poison fangs common to all poisonous snakes, has a double row of sharp curved teeth. The tail is terminated by a little spur or horny excrescence, which has given the name to the genus. There are several species. They are all of small size, are viviparous, reside on dry land, secreting themselves in rat-holes or beneath the roots of trees, and feed on small lizards, frogs, &c. One of the species found in Australia is considered to be the most venomous reptile of that country.

Acanthopleura (*ακανθα*, a spine; *πλευρα*, the side).—A genus of mollusca. See CHITONIDÆ.

Acanthopterygii (*ακανθα*, a thorn; *πτερυξ*, a wing).—An order of bony fishes in which the first dorsal fin, where there are two, or the first portion of the fin, where there is only one, has always spiny rays. In the anal fin, and generally in the ventral also, one of the rays is spiny likewise. This order contains by far the greater number of the ordinary fishes, many of them useful to man as articles of food, and of considerable value in a commercial point of view; such as the mackerel, &c. See SCOMBERIDÆ.

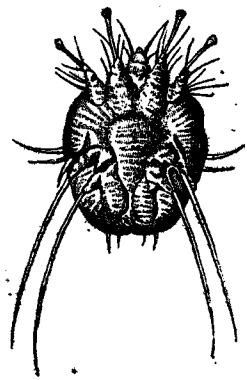
Acanthotheca.—A genus of intestinal worms. See ENTOZOA.

Acanthuris (*ακανθα*, a thorn; *ουρα*, a tail).—A genus of acanthopterygious fishes, remarkable for the sharp and lancet-like spines which are placed on each side of the tail (hence the name of the genus), and which when the fish is handled incautiously inflict serious wounds. There are several species, natives of the sea, of both East and West Indies, distinguished by the beauty of their colours and variety of form, and living entirely on vegetable matters, such as sea-weeds, &c. The colonists and sailors call them surgeon fishes, lancet fishes, &c.

Acanthus (*ακανθα*, a thorn).—A genus of dicotyledonous plants belonging to the nat. ord. *Acanthaceæ*. The species are herbaceous, and are found in the south of Europe, Asia Minor and India. One of the species, *A. spinosus*, with prickly pinnate leaves, and flowers tinged with pink, is found growing on the borders of cultivated fields or gardens in Greece. This is the plant which is now considered to have given Callimachus his first idea of the Corinthian capital. Vitruvius relates that the nurse of a young girl who died at Corinth, carried her cherished playthings to her tomb, and having left the basket containing them, covered with a tile, over the root of a plant, it was encompassed all round by

the leaves of the acanthus, till meeting with the tile they curled back in a kind of scroll. The tile constitutes the *abacus*, the leaves the *volutes*, and the basket the *capital*.

Acaridæ.—A division of the tracheary *Arachnida* containing the minute animals generally known as *Mites*, *Ticks*, &c. They are a numerous tribe of little creatures, some of which are free and live a wandering life, while others are fixed and live parasitic upon other animals. Those which are free have a mouth with distinct mandibles, and are what are properly called *Mites*. Of these there are,—1st, the true mites, *Acaridæ*, one species of which, *Acarus domesticus*, is found on all kinds of dry provisions, as old cheese, for instance, the powder of which consists entirely of these little animals with their eggs and excrement; also on flour, brown sugar, &c.; while another species, *A. destructor*, is exceedingly annoying to entomologists and zoologists, feeding upon dried insects, stuffed animals, &c. 2d, The garden mites, *Trombidiidæ*, living upon the leaves, flowers, fruit, and bark of trees. One species, common in spring, is of a blood-red colour. 3d, The spider mites, *Gamasidæ*, amongst which is the red spider of hothouses, *Gamasus telarius*, which, though exceedingly small, is a great pest to nurserymen, from its forming upon the leaves of plants a very fine web which causes them very much injury. 4th, The wood mites, *Oribatidæ*, which are found creeping slowly upon stones and trees amongst moss. Those which live a parasitic life have the mouth in form of a sucker, and are the *Ticks*. Of these there are,—1st, the true ticks, *Ixodidæ*, which are found in thick woods, attached to low plants, and are ready to fasten upon dogs, cows, horses, and other quadrupeds which approach them. They bury their suckers so deep in the skin of these animals that it is almost impossible to detach them without tearing away the skin to which they are fastened. They multiply so rapidly that oxen and horses attacked by them have been known to perish from mere exhaustion. The *Ixodes ricinus*, or tick of the dog, is at first very much flattened, but it soon begins to acquire a large size, and at last appears swollen out like a bladder. The *I. reticulatus*, or tick of the ox, is often when thus swollen out half an inch long. 2d, The plant ticks, *Bdellidæ*, which live parasitic upon plants. 3d, The water ticks, *Hydrachnidæ*, which live in the water and are very numerous. They vary in form and colour, and when young undergo a regular metamorphosis during their progress to maturity. The larvæ have only six legs, and when they assume the pupa state they become inactive and attach themselves to the bodies of other aquatic insects, as the Dytisci or water beetle, the Nepæ or water scorpions, &c. 4th, The harvest ticks, *Leptidæ*, one species of which, the *Leptus autumnalis*, well known as the harvest bug, is common in autumn in grass and herbage, from which it gets on to our bodies, and though exceedingly small, produces extreme irritation in the skin. Amongst the parasitic acari one has been found to live entirely in the skin of man, the *Sarcoptes galei*, producing the disease called the itch. It is very minute, scarcely visible to the



Sarcoptes galei—Itch insect.

naked eye, but when examined by the microscope is found possessed of a peculiar suctorial apparatus at the extremities of the four anterior feet, by which it is enabled to adhere to the most polished surface. Another curious microscopic animal has also lately been found inhabiting the sebaceous sacs and hair follicles of the human skin, the *Demodex folliculorum*. Its body is elongated, with eight short legs, and its chief residence appears to be the sebaceous follicles of the nose, where it may be recognized by a minute dark coloured speck, or raised point in the skin. This curious little animal has by some naturalists been referred to the *Acaridæ*, but by more recent zoologists it is considered to be more nearly related to the *Rotifera*, its parasitic habits causing it to resemble some of the numerous forms of the *Crustacea*.

Acasta (A sea nymph).—A genus of cirripedian crustacea. See BALANUS.

Acaules (*a*, priv.; and *caulis*, a stem).—Plants which have either a very indistinct stem, or none at all; such as the *Lichens*, *Fungi*, *Algæ*, &c.

Accipiter. *The Hawk genus.*—See ACCIPITRINÆ.

Accipitres.—An order of birds, also called *Raptatores* and *Rapaces*. They are distinguished by having powerful hooked beaks and talons; great strength and extent of wing, adapting them for rapid flight, and a general organization suitable for preying upon other animals. They are among birds what the carnivora are amongst mammalia. The females are generally larger than the males, and they only lay a few eggs, which are hatched in an artificial nest usually built upon inaccessible rocks or high trees. Some

of these birds of prey exercise their calling during the day, and are called diurnal birds of prey. They have the eyes directed sideways, the plumage close, and the quills strong. The young undergo no change of feather till their second autumn, being during their first period of life densely clad in short soft down. This division contains the vultures and falcons. See VULTURIDÆ and FALCONIDÆ. Others only exercise their calling during the evening, and are called nocturnal birds of prey. These have large eyes directed forwards, and their plumage is soft and downy. This division contains the owls. See STRIGIDÆ.

Accipitrinæ. *The Hawks.*—A sub-family of birds belonging to the order *Accipitres* and family *Falconidæ*. The birds of this family are distinguished by their wings being shorter than their tail, the fourth quill being the longest, by their beak being short and hooked from the base, and the margin of the upper mandible being greatly festooned. Hawks are natives for the most part of cold climates, they skim the earth with a low and rapid flight, seizing their prey upon the wing, and sometimes pouncing upon it from above. The type of the family may be considered the common sparrow hawk, *Accipiter nisus*. This bird has a wide geographical range, being found in most parts of Europe, extends from Russia to the Cape of Good Hope, and is also a native of Japan. It is bold and spirited, but is one of the most destructive of all predaceous birds that inhabit Great Britain. It haunts wooded districts and preys upon pigeons, partridges, &c., and is the terror of the poultry yard. The male is about twelve inches in length, and the female is generally three inches longer. She builds her nest in hollow trees, high rocks, or lofty ruins, and very often takes possession of some deserted nest of the crow, or other bird, in which to lay her eggs. The sparrow hawk was formerly used in falconry,

Accipiter nisus—Sparrow hawk.

and was considered the best of all the hawks for landrails. It was in ancient times held in great veneration among the Egyptians, being the emblem of their god Osiris, and among the Greeks it was consecrated to Apollo. The goshawk, *Astur palumbarius*, is a larger species than the last, the female being twenty-three or twenty-four inches in length. It is a widely distributed species also, inhabiting most parts of Europe, especially the northern parts, and extending through the temperate parts of Asia and America, as far as Japan. It chooses for its habitation the deep solitudes of forests, flies low, and preys upon hares, squirrels, and the larger ground birds; upon mice, rats, and small birds, which it takes on the wing. It is very destructive to game, darting after them with great impetuosity in a straight line; but if the object of its pursuit escapes its first attack, it desists, and will sit patiently on a tree or stone till some fresh game presents itself. The goshawk was formerly much used in falconry, and is said to be still used by the emperor of China for this purpose. One of the birds of this family, *Meliëraax canorus*, is remarkable for the habit the male has of singing for hours together while the female is on the nest. The note is not disagreeable. Many other species are described, some natives of India, such as *Accipiter Dukhunensis*, found in the Deccan; and others of America, such as *Herpetotheres cachinnans*, a fine bird from Guiana. Some inhabit South America, and one or two are found in New Holland, such as the collared sparrow hawk, *Accipiter torquatus*, well known in Van Diemen's Land and New South Wales as possessing all the bold and daring characteristics of its European ally.

Acclimation (κλιμα, climate). — A term used to express the sort of struggle which takes place in organized bodies between them and the climate, when a transition takes place. When a plant is suddenly transported from one *soil* to another, it droops and withers till it has overcome the effects of the change—perhaps it dies. It is much the same with animals; they succumb to the effects of the translation also and deteriorate at first. Transport them suddenly to a different *climate* and the evil effects produced are even much more apparent. Man himself has a hard struggle to sustain the change, and the effects are more or less apparent for generations. To effect a successful translation of an organized body from one climate to another, it is necessary to make the transition gradually. The vine when transported directly from France to the West Indies, became naturalized with great difficulty, whilst the same plant from Madeira and the Canary Islands (an intermediate climate), was cultivated successfully. Geese and other poultry, when transported from Europe to Central America, suffered much deterioration at first; they laid eggs seldom, and these were few in number at a time. Scarce a fourth part of those were hatched, and half of those that were, died within the first month. Now these birds have become acclimatized and thrive in that climate well. It was the same with sheep and domestic animals transported to the same climate; they became smaller and they lost their fertility to a great extent, till such time as the struggle between their organization and the climate was ended, when they at last became able to bear the change.

Acephala (α, priv.; and κεφαλη; a head).—A sub-class of molluscous animals, principally characterized by having a headless body, and a very large mantle which envelops the body so that there is a spacious and more or less closed cavity in which the oral and anal orifices are often concealed. Some have the body wholly asymetrical, and so enclosed in the mantle, that there are only two narrow openings. This section contains the ascidians. See TUNICATA. Others are symmetrical in form or divided into right and left sides, and provided with two shelly valves, and their mantle, which is more or less closed, contains within it two pairs of lamelliform tentacles and branchiæ. This section contains the mollusca generally known by the name of bivalve shells. See CONCHIFERA.

Acephalocysts (α, priv.; κεφαλη, head; κιστη, a cyst).—In various parts of the body of man and other animals, as the liver, cavity of the abdomen, &c., are often found simple sacs filled with a transparent liquid, and generally described by pathologists under the name of *Hydatids*. They used to be considered parasitic animals, but recent observations prove them to be the cysts of a genus of intestinal worms (*Entozoa*), called *Echinococcus*. These sacs are oval or approaching to spherical, and vary in size from a pin's head to that of a child's. They appear to increase by gemmation, developing smaller cysts between the laminæ of the parent which are discharged from its inner or outer surface. They are composed of a homogeneous substance resembling albumen in properties. The number of these cysts developed in the liver, &c., is sometimes astonishing, amounting to many hundreds. In general, when they are discovered, the *Echinococci* have either disappeared by death and dissolution, or they have not yet been formed. From the observations very recently made, it is most probable the *Echinococci* which inhabit these cysts are only a particular state of existence of other entozoa, such as Tæniæ or tape worms, and that their development takes place in the manner described in ALTERNATION OF GENERATIONS.

Acer.—A genus of plants belonging to the nat. ord. *Aceraceæ*. The species are numerous, and widely diffused throughout the north of Europe, Asia, America, and India. Amongst the European species are the maple, *A. campestre*, and the sycamore, *A. pseudo-platanus*, which afford wood valuable to the turner. The polished maple of Nepaul, *A. lævigatum*, is used by the natives for building purposes. The Tartarean maple of the southern provinces of Asiatic Russia, *A. tartaricum*, affords a hard white wood, and the Calmucs obtain from the *keys* or seed-vessels, boiled in water, an astringent beverage, which, mixed with milk and butter, forms a favourite article of their diet. In North America the sugar maple, *A. saccharinum*, is very abundant, and often reaches the height of eighty feet. In the autumn the woods are dyed of a crimson hue by its changing leaves. The wood is hard, but is not much used, as it is readily attacked by insects; and yet the tree is in great request. It furnishes a copious supply of excellent sugar. The trunk is tapped in the spring, and it is said that as much as thirty-three lbs. of sugar are obtained from the sap which flows from a single tree. Several other species afford useful wood for turning purposes.

Acherontia.—A genus of lepidopterous insects belonging to the family *Sphingidæ*. A species of this genus is found in this country, and from the remarkable appearance on the back of the thorax of the representation of a human skull, is called the *Death's-head moth*. The moth itself is from four to more than five inches in expanse of wing, and is a very handsome insect. When disturbed or handled it emits a peculiar squeaking noise. It attacks bee-hives, devouring the honey and scattering the bees. Amongst the ignorant and superstitious, it is looked upon with dread, and its appearance is considered ominous. The well armed and numerous inhabitants of the bee-hive too, seem to fear its approach, as though unarmed itself, when it attacks the colony, it is always successful. The larva or caterpillar, is a handsome, beautifully marked and large creature, measuring about five inches in length. It feeds upon the leaves of the potato and jessamine; changes into a chrysalis in the month of September, retiring for that purpose deep under the surface of the earth, and emerges a complete insect in the following June or July.

Achetidæ. *The Cricket family.*—A family of saltatorial *Orthoptera*, containing those insects which are familiarly known to us by the name of crickets. The French entomologists apply to those insects the name *Gryllidæ*, which English authors on the contrary apply to the grasshoppers. See GRYLLIDÆ. The English name cricket, and the French name cri-cri, given to those insects, is derived from the stridulous sound produced by the males, and resembling the word "cris-cris." This peculiar sound is produced by their rubbing the inner edges of the wing-covers together. They are solitary animals, each individual forming for itself a burrow in which it passes the day, coming out only in the evening to seek for its food. At the mouth of his burrow the male takes up his abode, and commences his strong and rapid chirp in order to attract the female. Some live upon animal food, others upon vegetable matters; and children in France capture them by introducing an ant tied to the end of a string, or a long straw, into their burrows, which, being seized by the cricket, it is drawn out. They seem to like heat, as their burrows are constructed with a southern aspect. They are very timid, at the least alarm ceasing their stridulous noise, and taking refuge in their holes. The females, which are mute, are very prolific, each one laying about 300 eggs towards the middle of summer. The larvæ are like their

parents, but are wingless, and, soon after being hatched, excavate burrows for themselves, and take refuge in them for the winter. In Africa, some species are made the objects of commerce, the natives bringing them up in small cages, and selling them to the inhabitants, who love to hear their stridulous noise. The species are rather numerous, those of the genus *Acheta* being characterized by their very swollen head, and the antennæ having the first joint short and thick. Several are peculiar to Europe, and are very common. The field cricket, *A. campestris*, is very abundant, frequenting hot sandy districts, and forming its burrows in situations exposed to the sun. The house cricket, *A. domestica*, is equally abundant, but is always found in houses, frequenting the rooms level with the ground, and especially preferring parts near the chimney and fire-place, into the mortar of which they burrow, even within a few inches of the fire. In some houses they are so numerous as to be a great pest, flying into the candles, and dashing into peoples' faces. They are easily destroyed by placing phials half filled with beer into their haunts, and the insects crowding in are drowned. The mole cricket, *Gryllotalpa vulgaris*, belongs likewise to this family. It is one of our largest native species, and derives its name from the analogy which it affords, both in structure and habits, to the common mole. It burrows under ground like the mole, raising a ridge as it proceeds, but seldom throws up a hillock. They sometimes prove very destructive to the garden, destroying whole beds of cabbages, young legumes, and flowers.

Achirus.—A genus of flat fish belonging to the sub-branchiate division of the *Malacopterygii*, and resembling in general appearance the sole. The species are of considerable number, natives of the seas of both East and West Indies, and are wholesome food. They have no air bladder, and consequently remain for the most part at the bottom of the sea, though not in very deep water.

Achlamydeæ (*α*, priv.; and *χλαμυς*, a covering).—A term used in botany to denote those plants in which the floral envelopes, or calyx and corolla, are both wanting. They are called *naked* or *achlamydeous*. See Corolla.

Achorion (*αχωρ*, ulcer of the head).—The common disease of the skin called *Porrigo* or *Tinea* (scald head), is now known to be produced, or at all events connected, with the appearance of certain vegetable growths. One of these has been named *Achorion*, and is found immersed in the human skin, especially in the head, either in the hair follicles, or in depressions of the surface. It is of a round shape, of a yellow colour, and coriaceous consistence. A true *Puccinea* occurs in this disease of the skin, and it is not unlikely but that *Achorion*, instead of being a distinct genus, is only the forerunner of *Puccinea*, the spermagonea of that plant. Other fungi, called *Porrigophytes*, are found in the crusts of porrigo, and the *Mentographytes* in those of the disease attacking the chin and beard called *Sycosis Menti*; while apthous ulcerations are connected with those forms called *Apthaphytes*.

Acipenser, *the Sturgeon.*—A genus of fishes. See Sturionidæ.

Aconitum (*ακονιτον*; the Greek name for the hemlock).—A genus of plants belonging to the nat. ord. *Ranunculaceæ*. There are several species, some of which are remarkable for their poisonous properties. The commonest species, *A. Napellus*, monk's hood, or wolf's bane, a plant to be found in almost every cottager's garden, is a native of Switzerland and other mountainous parts of Europe, and contains extremely powerful narcotico-acrid qualities. Those with blue flowers are said to be stronger than those with yellow or white ones. All the parts of the plant abound in this acrid property, but especially the roots, which are scraped and mixed with food to form a bait for wolves and other dangerous animals. It is stated that the huntsmen of the Alps, who hunted wolves and other savage beasts, used to dip their arrows in the juice of this plant, and that the wounds inflicted were thereby rendered mortal. A narcotic alkaloid called *aconitina* is produced from the leaves and root, which is used in medicine, particularly in neuralgic affections. Another species, *A. ferox*, a native of Nepaul, is still more powerful in its effects. From the root of this plant is produced the poison called Bikh or Nabee, which is said to possess the concentrated power of the poison of all the European species put together.

Acoreæ, or **Acoraceæ.**—A sub-order of plants belonging to the nat. ord. *Araceæ*, to which the genus *Acorus*, or sweet flag, belongs. The drug sold in our shops as Calamus aromaticus is the produce of one species of this genus, *A. calamus*. The plant is a native of this country, various parts of Europe, and also of India; and it is the root of the Indian variety which is imported from the Levant that is used in medicine. The Turks candy it and regard it as a preservative against contagion. In England, the leaves when bruised are fragrant, and they were formerly employed to strew the floors of rooms, churches, &c., under the name of rushes. The practice is not quite discontinued; and in Norwich cathedral the floor is strewed still upon certain high festivals with the sweet rush.

Acotyledones, or **Acotyledoneæ** (*α*, priv.; *κοτυληδον*, seed vessel).—A class of plants in the natural system commonly known as flowerless plants, and corresponding with Linnæus's class *Cryptogamia*. They derive their name from their vegetating without the aid of the seed lobes called cotyledons. They are destitute of true flowers, and have no distinct sexual organs. The embryo is a cell, or, as it is called, a *spore*, with granular matter in its interior without any separation of parts, germination taking place in any part of its surface and not from fixed points. This spore

when formed, sometimes presents filaments or vibratile cilia on its surface, by means of which it moves about in fluids like some of the infusoria. Many of these bodies have indeed been described as animals belonging to that class. See DIATOMACEÆ. They are extremely numerous, 1,200 genera having been described containing above 12,000 species. They vary much in size, some being very lofty, as the tree ferns, others exceedingly diminutive, and many quite microscopic, such as the minute lichens, fungi, and algæ. The fossil species are also very numerous, occurring abundantly in the earlier or palæozoic strata, and especially in the carboniferous series. Many of these are of immense proportions. The *Acotyledones* are divided into two great sub-classes, the ACROGENÆ and THALLOGENÆ—which see.

Acridii, or **Acrydii** (*ἀκρίς*, locust).—A family of insects synonymous with LOCUSTIDÆ.

Acrita (*ἀκρίτος*, indistinct).—A division of the animal kingdom formed to contain those animals of the lowest and most simple forms, which are distinguished chiefly by the absence of a nervous system. A negative character like this must naturally be a more or less undecided one. Our knowledge of the lower forms of existence is increasing daily, and as it extends, and as further or more accurate research indicates the existence of nerves in creatures in which it has previously escaped detection, the number of animals contained in such a division must vary accordingly. At first this division contained the *Acalephæ*, certain forms of *Entozoa*, the *Polypifera*, &c., &c. It now includes only the *Infusoria*, *Rhizopoda*, and *Sponges*.

Acrodus.—A genus of fossil placoid fishes, occurring almost exclusively in the *lias* and *oolite*. Several species are found in England.

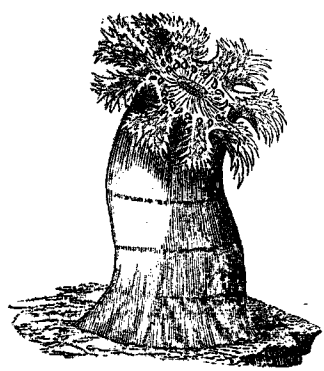
Acrogenæ, or **Cormogenæ** (*ἀκρος*, summit; *κορμος*, a stalk or stem; and *γενναω*, to produce).—A division of the class *Acotyledones*; containing those acotyledonous plants which have usually more or less distinct stems and leaves, a certain amount of vascular tissue, stomata, and cases containing spores. They are the most advanced of the flowerless plants, and, from late observations, the existence of sexuality among them is highly probable. The species are numerous, but with few exceptions are of little utility to man. They are divided into several families. I. The *Equisetaceæ*, or horse tails. The species of *Equisetum* grow very abundantly in ditches, lakes, and rivers in this country, and various other parts of the world. The stems are striated, hollow, articulated, usually branched, having no true leaves, but in their place green jointed branches arranged in whirls at the articulations of the stem. In South America they occur fifteen feet high and three inches in circumference. The stems usually contain a great deal of silica in their composition, and some of the species, as *E. hyemale*, the Dutch rush, are used in consequence for polishing mahogany. II. The *Filices*, or ferns. The ferns are very numerous, between 2,000 and 3,000 species having been described. The stem generally runs along or under the surface of the ground, and sends off roots from its lower surface, and fronds or leaves from its upper side, as in *Polypodium*, &c.; this is called a rhizome, but sometimes it rises into the air so as to form an acrogenous trunk, as in the case of the tree ferns. The spores, or seed vessels, are generally placed on the under surface or margins of the fronds. They are generally rather diminutive in size in cool climates, though in tropical countries they often rise to the height of thirty or forty feet. The *Aspidium* (*Lastrœa*) *filix mas*, or male fern of this country, and other parts of Europe, has been used in medicine; the rhizome powdered, being considered an excellent vermifuge, especially in cases of tape worm. It is also used for tanning. The *Aspidium Baromez* of the Volga has the stem covered with a silky down, and when prepared in a particular way it so much resembles in appearance the form of a lamb, that it is called the *Tartarean or Scythian lamb*. From the *Adiantum Capillus Veneris*, or maiden's hair of this country, and other parts of Europe, and from the *Adiantum pedatum* of America, is prepared the syrup called capillaire. Some of the ferns, as the *Pteris esculenta* of Australia, and the *Marattia alata* of the Sandwich Islands, are used by the natives as food. The *Davallia Canariensis* has the stem covered with woolly matter, and has received the name of hare's foot. The *Pteris aquilina*, the common brake or bracken of this country, shows the arrangement of the vascular system when the stem is cut across transversely, and then presents the appearance of a spread eagle. III. The *Lycopodiaceæ*, or club mosses. These are moss-like plants, intermediate between ferns and mosses. Their stems are creeping, or bulbiform (corms). They are not so numerous, about 200 species only having been described. They abound in warm, moist, insular climates. Some of the species of *Lycopodium* possess emetic and cathartic properties, though they are not used in medicine. The powdery matter in the seed cases is inflammable, and has been used in pyrotechny as a substitute for sulphur, under the name of lycopode, vegetable brimstone, or witch meal. A Brazilian species, the *Lycopodium squamatum*, coils up into a ball during the dry season, and unrolls during the wet season. IV. The *Marsiliaceæ* or pepper worts. A small family of stemless plants which are found creeping or floating in ditches and pools in various parts of the world, more especially in temperate climates. V. The *Musci*, or mosses. The mosses are very numerous, upward of 1,100 species being known. They have a distinct stem, with minute and imbricated leaves at the base. The spore cases are enclosed in a cap-like hood, called calyptra. They are either

erect or creeping plants, and are found both in damp situations on land, or in the water. They extend from the arctic to the antarctic regions, though they abound most in temperate climates. They are stated to be amongst the first vegetables which appear on newly formed islands, and to be among the last occupants of exhausted lands, or of an inappropriate climate. VI. The *Hepaticæ* or liver worts. A numerous tribe (upwards of 700 species having been described), with a stem either bearing imbricated cellular leaves, or leafless, and bordered by membranous expansions which sometimes unite at their margins, forming a broad lobed frond or thallus. They are terrestrial plants, growing in moist situations, or in water, and are generally diffused over all the world. The *Marchantia hæmisphærica* has been recommended by some medical men as a remedy in cases of dropsy.

Acrolepis (*ακρος*, summit; *λεπις*, a scale). —A genus of fossil ganoid fishes found in the magnesian limestone of Durham. The species have large pointed conical teeth, and the scales are surmounted by a keel.

Actinia (*ακτις*, a ray of the sun).—A genus of zoophytes. See ACTINIIDÆ.

Actiniidæ.—A family of zoophytes belonging to the class *Anthozoa*, order *Helianthoida*. The animals belonging to this family are composed of a fleshy body resembling a truncated cone seated on a flat plain base, and generally attached by a glutinous secretion to stones, rocks, or shells, &c., in the sea. The centre of the upper surface is dimpled with the opening into the mouth, and this aperture is furnished with numerous simple, tubular, retractile tentacula, placed in one or more series round it. The body is variously coloured, and the tentacula, brilliant with lively hues and disposed in circles, give a very striking representation of the petals of a beautiful flower. They are, from this resemblance, generally called sea anemonies, and so like are they to a flower, that bees have been seen arrested by the resemblance while flying over them, and dart through the water to reach them. A cluster of these elegant creatures, seen a few feet below the surface, in clear still water, with their tentacula fully displayed, as may be seen, for instance, on the coast of the isle of Arran, presents a striking appearance; and travellers who have watched them in tropical seas speak enthusiastically of their beauty. These tentacula are furnished with the peculiar nettling apparatus described in MEDUSA. It is by means of these organs that they seize their prey, and sometimes they use them also as organs of locomotion. They may generally be handled without their producing the stinging sensation of the acalephæ, but when the finger is placed upon the tentacula, they adhere with considerable force to it. They live upon small molluscs, crustaceans, &c. They are oviparous, the eggs being expelled from the ovaries, apparently through some portion of their body, as the mouth, or through the tentacula. Sometimes, however, they are detained for a time in the interseptal spaces till they have gone through their first stage of evolution, which has given rise to the idea mentioned by many zoologists, that the actiniæ are viviparous. Their movements are very slow, the animal gliding along with an almost imperceptible motion. Sometimes they detach themselves from their resting place altogether, previously distending the body with water to render it more buoyant, and then allowing themselves to be carried along by the random motion of the waves. They are very sensitive to external irritations and to atmospheric changes, closing themselves up in cloudy and stormy weather, and expanding themselves again when the sky is serene. The actiniæ rival the hydræ in their reproductive powers. The tentacula, if cut away, soon grow again. If the body be cut transversely through the middle, the lower portion will soon produce new tentacula, the upper portion forming for itself a new base, and if completely cut through perpendicularly, two perfect animals will be the result. The true *Actiniæ*



Actinia dianthus—White Animal-flower.

fix themselves by a broad, flat base. The species here figured is the white animal-flower *Actinia dianthus*. The *Lucernariæ* attach themselves by a slender peduncle to sea weeds, &c Their mouth is quadrangular, placed in the centre of an expansion in the form of an umbrella, divided into four or eight lobes, each lobe being furnished at the extremity with numerous tentacula. They can swim with some rapidity by alternate dilatations and contractions of the body.

Actinocrinus.—An extinct fossil genus of radiated animals. See CRINOIDEA.

Actinolite (*ακτις*, ray of the sun).—A mineral occurring in talc rocks. It is a variety of hornblende, having a radiated structure.

Actinophrys.—A genus of animals belonging to the class *Infusoria*. The animals belonging to

this genus are of a globular or discoid form, the body without vibratile cilia, but surrounded with radiating, filiform, very delicate and slowly contractile expansions or tentacles. The body is composed of a homogeneous substance with granules or vacuoles in its interior. The tentacula have the faculty of agglutinating to themselves the bodies of any infusoria or minute algæ which happen to come into contact with them, and killing them with great rapidity. When one of the tentacula has thus seized its prey, it slowly shortens, the surrounding ones come to its assistance, bend their points around the captive, and thus gradually surround it on all sides, and finally bring it to the surface of the body. This portion of the body slowly becomes more and more depressed, till the little captured creature finally becomes lodged in its substance. The edges of the depression coalesce and form thus a cavity closed on all sides, in which it remains for a certain time and becomes digested. Should any indigestible matter remain, it is expelled through the substance of the body, either in the same place where it entered, or at a spot in a different direction. If two distinct individuals come into contact, the same agglutination takes place, till they are fused into one large single animal. The movements of the species of *Actinophrys* are so very slow, that one is almost tempted to doubt their animality altogether. The *A. sol* is the best known species, and occurs in fresh water, in which plants, as confervæ, &c., are growing.

Adamantine Spar, or Corundum.—A simple mineral containing ninety per cent. of alumina, a little iron and a little silica, and, with the exception of the diamond, the hardest substance known. *Emery* is a granular variety of corundum, much used for polishing steel, &c. The *Sapphire* has the same elements as adamantine spar, containing ninety-four per cent. of alumina. Next to the diamond it is the most precious of gems. The Oriental ruby, Oriental topaz, Oriental amethyst, and Oriental emerald, are red, yellow, violet, and green sapphires. They are found in gravel and sand in the island of Ceylon and in Pegu, but are never seen in a matrix.

Adansonia.—A genus of plants belonging to the nat. ord. *Bombaceæ*. There is only one species known, *A. digitata*, the baobab, sour gourd, or monkey bread. It is a large tree, discovered in Senegal by M. Adanson, the French botanist, and named after him. The trunk is short, only from 12 to 15 feet high, but from 70 to 80 feet in circumference. It is crowned with an enormous head of branches measuring 140 feet in circumference, some of them 50 to 60 feet long, and rising to a height of 60 or 70 feet from the ground. The bark is an inch thick. The flowers are very large, and hang pendulous from the bosom of the five lobed leaves. The bark and leaves, dried and powdered, are used by the natives of Senegal, as pepper and salt are by Europeans, and called *lalo*. Infused in their drink, they consider it as a preservative against fever. From the ashes of the woody bark of the

Adansonia digitata—The Baobab tree.

fruit, and the fruit itself, they prepare with the assistance of palm oil, an excellent soap. The wood of the tree is soft, and is liable to a peculiar disease which causes a decay of all the woody fibres, and the wild bees then perforate it and lodge their honey in the holes. Of this soft and decayed trunk the negroes make a singular use. They hollow it out completely, and deposit within it the bodies of persons held by them in a sort of superstitious dread and awe. These are the poets and buffoons, of which there are always a certain number at each native prince's court, and whose dead bodies are held in such dread by the natives from a superstitious apprehension that if buried in the ground the earth would no longer produce fruit, and if thrown into the rivers or sea, the water would become noxious, that they adopt this method of disposing of them. In these natural tombs they remain, and from the heat and dryness of the climate soon become perfect mummies. Humboldt considers this tree, from M. Adanson's calculations, to be the "oldest organic monument of our planet,"—some of the trees at the period of Adanson's visit to Senegal being reckoned by him to be probably 5,000 years old.

Addax.—A genus of antelopes. See ANTILOPEÆ.

Adiantum (*ἀδιαντον*, derived from *a*, priv.; *ἰδαινω*, to moisten, because the leaves are of such a nature that water will not moisten them).—A genus of ferns. See ACROGENÆ.

Adularia. *Moonstone.*—A mineral substance. See FELSPAR.

Aecidium.—A genus of minute parasitic plants belonging to the nat. ord. *Fungi*, found in great abundance in this country. The species are universally parasitic upon the leaves or flowers or bark of living plants, where they are generated beneath the cuticle. One species attacks the barberry, the *Aecid. berberidis*, and shows itself by a bright orange powder collecting on the leaves and flowers—the sporules of the fungus. It is a common idea among farmers that barberry bushes blight corn, and it is pos-

ible that the spores of *Aecidium* might produce the *Puccinea* on the corn.

Aegocerus.—A genus of antelopes. See ANTILOPEÆ.

Aepiornis.—A genus of fossil struthious birds. See DINORNIS.

Aequorea (*æquor*, the sea).—A genus of *Acalephæ*. See MEDUSA.

Aerolites (*ἀηρ*, atmosphere; *λιθος*, a stone).—Meteoric stones, or bodies, which have fallen from the air upon the earth. At first the fact of stones seen falling from the atmosphere upon the earth was treated with ridicule. Now the occurrence is well known to be true. The fall of these stones is always accompanied with a meteor which at night appears in the form of a large ball of fire. The bodies are sometimes very large. Their composition is very similar in whatever part of the world they have been observed. When taken up immediately after having fallen they are found to be very hot. Iron is found in them all in considerable proportion, and always in combination with the rare metal nickel. Silica, magnesia, and sulphur, compose the other portions. The origin of these stones is still obscure. The most generally received opinion in the present day is, that the meteors are bodies moving in space, either accumulations of matter as originally created, or fragments separated from a larger mass of a similar nature. In other words, it is believed that there exists round the sun an immense zone of solid bodies more or less voluminous, circulating round it like the planets, but much too small to be perceived in ordinary cases. It is believed, further, that the earth comes at certain epochs into the neighbourhood of this zone; that it then attracts these small bodies towards it; that they inflame while traversing our atmosphere, melt, and burst into *aerolites*.

Aeschylus. *The Horse Chestnut.*—A genus of plants. See HIPPOCASTANEÆ.

Aethusa.—A genus of plants belonging to the nat. ord. *Umbelliferæ*. A species called Fool's parsley, *Aeth. Cynapium*, is common in our fields and gardens, and is very poisonous. It resembles the common parsley so much that it is often mistaken for it, and dangerous accidents have arisen in consequence. The usual effects produced by eating this plant are swimming of the head, nausea, cold perspirations, and chilliness of the extremities. To counteract the poison, an emetic ought to be given immediately, and this should be followed up by the free use of weak vegetable acids, such as lemon juice, vinegar, or sour wine.

Agallochum.—A genus of plants. See AQUILARIACEÆ.

Agalmatolite (*ἀγαλμα*, ornament; *λιθος*, a stone).—A species of mineral, soft and unctuous to the touch, resembling soapstone, which is found abundantly in China, and comes to this country cut into various forms and figures.

Agamidæ.—A family of saurian reptiles. The animals of this family have a depressed body, a short, broad, and flat head, a short neck, and a tail about the same length as the body. Their body is enveloped in a loose skin, which is capable of being distended with air at the will of the animal; and being covered with small scales which are often prolonged in the form of little spines, especially on the back, it presents a very bristling appearance when thus inflated. The species are numerous and are widely distributed, being found in Asia, Africa, Australia, and South America. They are of rather diminutive size, and lurk among rocks, heaps of stone, and mouldering ruins, amongst which they conceal themselves, or climb trees and sport among the branches in security. They generally feed upon insects and other small animals, though one species, a native of India, is said to be herbivorous. The Tapayaxin, *Agama orbicularis* of South America, is short and thick, the head broad and flat, the tail short, and the belly protuberant. To this ungainly figure it adds the power of distending its skin, which is covered with scales and small protuberances or warts intermixed, and often, to a certain extent, changing its colour like the chameleon. The Moloch, *Moloch horridus*, of Australia, is covered with spines all over, larger on the head, and over the eyebrows having the appearance of horns, which gives it a most ferocious appearance, though in reality it may be harmless enough.

Agaphyte.—A variety of the mineral known by the name of TURQUOISE.

Agaricia.—A genus of madrepore, resembling in form the mushroom, and hence called the *Mushroom-Coral*. There are several species, natives of hot climates, but in only one, a native of the West Indies, has the animal been seen.

Agaricus.—A genus of *Fungi*. See THALLOGENÆ.

Agate (*αχατης*, from the river *Achates*).—A mineral substance commonly known as the *Scotch pebble*, and much used in jewellery, &c. It contains ninety-eight per cent. of silica and a small proportion of iron, and is chiefly found in the amygdaloid variety of trap rock. Agates are found of all sizes, from a millet seed to a foot in diameter, but generally they occur from one to three inches in diameter. A great many varieties are found, and the stones which are called by lapidaries and mineralogists, *Carnelian*, *Calcedony*, *Onyx*, *Sardonyx*, *Mocha stone* or *Moss Jasper*, *Blood stone* and *Chrysoprase*, &c., are closely allied to the agate. The *Onyx* was known to the ancients, and used by them as it is done by the moderns also, for cutting cameos—the finest antique gems being cut from this species of stone. The principal mines of agate are situated in the little principality of Rajpepla, in the province of Guirat, fourteen miles from the city of Broach, where they are cut into beads, crosses, snuff-boxes, knife-handles, &c.,

and imported into this country; hence perhaps the jewellers' term "brooch."

Agathis.—A genus of plants; synonymous with DAMMARA.

Agave (*ἀγαυος*, admirable).—A genus of plants belonging to the nat. ord. *Amaryllidaceæ*. The species are known by the name of American aloes, and are distinguished by producing a cluster of long, stiff, fleshy leaves, closely folding over each other in the centre, and embracing the stem, which bears flowers in a long terminal woody scape. Most of the plants belonging to the *Amaryllidaceæ* have bulbous roots, but the *Agave* has fibrous roots, and the species are more highly developed both in leaves and fructification than the rest of the order. The *A. Americana*, or great American aloe, is the best known species. It is a native of intertropical America, and rises sometimes to the height of forty feet. In its native hot climate it grows rather quickly, but in the temperate countries into which it has been introduced, as Italy, Sicily, and Spain, it is slow of growth, and as it never flowers till it has attained its full size, which occupies a period of many years, it has been commonly supposed that this takes place only once in a hundred years. This, however, is a mistake, though in cold countries, and under the care of a gardener who may neglect the circumstances attending its proper development, it may occupy as many as fifty or even seventy years, before the flowers are produced. As soon as it has done flowering, the plant dies. The fibres of its leaves form a coarse kind of thread, which is brought into this country under the name of Pita-flax. The dried flower stems are an almost impenetrable thatch; the fresh leaves themselves, cut into slices, are occasionally given to cattle, and the centre of the flowering stem when split longitudinally is by no means a bad substitute for a European razor strop, owing to minute particles of silica forming one of its constituents. From the sap which is made to flow from the incised stem the natives of Mexico obtain an agreeable fermented liquor, known by the name of *Pulque*, from which is distilled a pleasant ardent spirit called *Vino Mercal*. The *A. Saponaria*, another species, a native of Mexico, gives out a mucilaginous juice which the natives use as soap for washing.

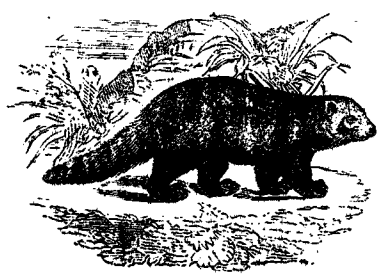
Agestrata.—A genus of beetles. See CETONIIDÆ.

Aglaius.—A genus of birds. See CASSICUS.

Agriotis.—A genus of beetles, the larva of which is the wire worm. See ELATERIDÆ.

Agrostis (*ἀγρος*, a field).—A genus of grasses containing a considerable number of species, amongst which the common one, *A. vulgaris*, is known to farmers by the name of Quicks, and is very troublesome from its rapidly overgrowing pastures, in consequence of its creeping, rooting, vivaceous stems. The *A. alba* is a useful grass, and, under the name of *Irish Fiorin grass*, has been much experimented upon in this country. It grows with great vigour in Ireland. The reedy bent-grass, *A. arundinacea*, is another species which grows in many parts of Europe. The Kalmuc Tartars weave mats of it, and thatch their houses with it. It is said to be peculiarly distasteful to goats—they will almost die of starvation rather than eat it.

Ailurus.—A genus of animals belonging to the class *Mammalia*, order *Ferœ*, and family *Ursidæ*. Only one species, *A. fulgens*, the Wah or Panda, is known, a native of the snowy regions of Nepâl. Though, from its dentition and



Ailurus fulgens—The Wah or Panda.

other characters, this animal belongs to the family of Bears, it differs from all the species of that family, by having the soles of its feet covered with a thick close wool, like the Weasels. The skin is covered with a full soft fur, and its tail is like a lady's boa, and banded with red and yellow. It is about the size of a large cat, is rather an elegant animal, and lives in the neighbourhood of rivers and mountain torrents, passing much of its time upon trees, and feeding upon birds and the smaller kinds of mammalia. It derives its name *Wah* from its cry.

Aira. *Hair Grass.*—A genus of grasses, of which a considerable number of species have been described. Many are natives of this country, and are ornamental as well as useful grasses for our pastures. It is said that it is the use of the *A. aquatica* by the cattle, which imparts the peculiar sweetness to the Cottenham cheese, and the fineness to Cambridge butter.

Air Bladder.—A peculiar organ containing air with which most fishes are provided, and by means of which they are enabled to adapt the specific gravity of their bodies to the various pressures of the superincumbent water at different depths. It is the homologue of the lungs in reptiles. Those fishes which live at the bottom of the sea, on sand banks, &c., such as the skate, turbot, sole, &c., have no air bladder, and those which live chiefly or obtain their principal food at the surface, such as the mackerel, have it very small. The air bladders of the cod fish are large,

and, when salted, form a considerable article of trade with Newfoundland. They are known as Cod Sounds. A very good kind of isinglass is made from these cod sounds; and the fine isinglass prepared by the Russians is procured from the sounds or air bladders of the sturgeon.

Air Cells.—Dilatations or expansions of the air passages. In birds the lungs communicate, by means of membranous cavities, with the bones, which in this class of animals are hollow and destitute of true marrow, with the quills and feathers, and with the substance of the body between the skin and adjacent muscles, &c. When the bird respires, the air passes from the lungs into all these cavities. In insects the air cells consist of dilatations of the tracheæ. See TRACHEA. By means of this arrangement of cells containing air, and distributed thus over the body, the specific gravity of the body is diminished, and flight is rendered more easy. In plants the air cells are circumscribed spaces surrounded by cells, and are often large in aquatic plants, serving the purpose of floating them, as in some of the *Algæ*.

Air Passages.—Large intercellular passages in the stems and leaves of aquatic plants.

Air Plants.—Plants possessing the power of living a considerable time suspended in the air, are called Air plants or *Epiphytes*. They are by many supposed to live exclusively suspended in the air, and not to demand any other requisites for thriving. This, however, is a mistake, for though they do not have any attachment to the soil, yet they are always found more or less attached to trees, &c. The *Bromeliaceæ*, containing the beautiful *Tillandsias*, and the numerous, interesting, and handsome tribe of *Orchids*, are the plants which illustrate this method of growth.

Air Sacs.—Small membranous sacs or pouches in certain plants, which are closed by a valve. The use is to enable the plant to float, and they are particularly visible in the genus *Utricularia*.

Air Tubes.—Horny tubes found in some of the abdominal segments of certain aquatic insects—as the larvæ of some of the *Diptera*—the water bugs, *Nepa*, &c.

Air Vessels, in plants, are tubes whose length greatly exceeds their breadth, and are formed of membrane. The typical form is the spiral vessel, which is elongate, and has a spiral fibre, or fibres, surrounding the interior of the cylinder. In some plants this can be unrolled. In the Banana and Plantain these fibres can be pulled out in handfuls and are used as tinder. In insects, see TRACHEÆ.

Alabaster.—A mineral substance used for ornamental purposes, and consisting of sulphate of lime,—analogous with gypsum. It is soft, and can be scratched with the nail. It derives its name from *Alabastron*, a town of Egypt, where there used to be a manufactory of vessels of this substance. These vessels or pots were much used by the ancients for holding perfumes, and it was from a vessel of this kind that Mary, the sister of Lazarus, poured "the precious ointment" on the head of Christ as he sat at supper. Vessels of this kind may be seen in the British Museum. Alabaster is found in Derbyshire and Staffordshire, and is manufactured into small ornaments and toys. It is of a kind of alabaster that the sculptures from Nineveh, discovered by Layard, are composed.

Alaudinæ. *Larks.*—A sub-family of birds belonging to the conirostral tribe of the order *Passeres*, and family *Fringillidæ*. There are several species belonging to the Alaudinæ, natives of different parts of the world, and characterized chiefly by a long and straight hind claw, and a strong straight bill of a little greater length than in the other genera of the Fringillidæ. They are granivorous birds, migratory in their habits, shake dust among their feathers instead of washing, and generally ascend singing to a great height in the air. The sky-lark or laverock, *Alauda arvensis*, is the best known species in this country. As a songster it is unrivalled, and has been extolled by poets from the earliest times. Shakspeare and Milton have not disdained to celebrate its praises. Indeed, "there can scarce be any description of the variety of the intense gushes, the prodigal outpourings of this Ariel of song, as he mounts till the eye can no longer follow him, though the ear still drinks his wild music." The male alone has the gift of song, and he is one of the earliest of our vocalists. In the early part of the year his note is heard, and it commences before the dawn of day. The female makes her snug little nest on the earth among the corn or herbage, and is very persevering in the process of incubation. Two broods are produced in the course of the year. But neither the fine music of the male, nor the parental fondness of the female, can guard them from the attacks of omnivorous man. They are unfortunately for themselves considered a great delicacy for the table, and many thousands annually fall a sacrifice to the nets of the fowler. The season for catching larks commences in this country about the middle of September, and continues till the end of February; and as they are very prolific, and are found in all parts of Europe and in the north of Africa, the quantity taken is enormous. Some years ago it was calculated that 4,000 dozen were annually caught to supply the London market alone; and at Leipsic, the excise duty on these birds amounts to 12,000 crowns, or £900 a-year. The wood-lark, *Alauda arborea*, is smaller than the sky-lark, and its note, though not so varied, excels it in the rich and melodious quality of its tone. It is more like that of the nightingale, and, as it often sings during the night, it has been frequently mistaken for that bird. It perches on trees, but only sings in the air. The sky-lark rises perpendicularly, but the wood-lark ascends flying in widely ex-

tended circles, and will sometimes continue in the air soaring to a great height, singing, still singing, for an hour together. It is a native of various parts of Europe, but is not so abundant or prolific as the sky-lark. The shore-lark, *Alauda alpestris*, is very common in North America, though it extends as far as the straits of Magellan. Its song is very sweet. It lives chiefly, and breeds, in the vicinity of the sea. The female is remarkable for parental affection when breeding. On approaching and disturbing her, she feigns lameness so cunningly, that none but one accustomed to the sight can refrain from pursuing her. The male immediately joins her in mimic wretchedness, uttering a note so soft and plaintive that it requires a strong stimulus to force the naturalist to rob the poor bird of its treasure. The nest is built amongst moss, and the moss so much resembles the bird in colour that one almost treads upon her before he is aware. The crested-lark, *Galerida cristata*, is distinguished from its congeners by the feathers on the crown of the head being more elongated, and forming a crest which is darker than the rest of its plumage. The song of this bird is fine, and it is said to be easily taught many airs, which it will learn perfectly and repeat without confusion. The calendra-lark, *Melanocorypha calandra*, is larger than the sky-lark, and has a more sonorous though not less pleasant song. In Italy, a person who sings well is complimented by saying, he sings like a calandra. It imitates readily the notes of other birds, the chirping of chickens, and even the squalling of a female cat. It is found in most parts of Europe. Fossil remains of larks were found by Dr. Buckland in Kirkdale cave, Yorkshire, and one species has been described from the tertiary strata.

Albatross.—A genus of birds. See PROCELLARIIDÆ.

Albino.—Amongst the natives of Africa there are occasionally found individuals perfectly white. These were termed by the Portuguese *Albinos*. The ancients knew of their existence also, and called them *Leucæthiopes*, or white negroes. The skin of these people is of a pearly whiteness, the hair of the head and over the whole body is quite white, and the eyes are red. This peculiar colour is now known to depend upon the absence of the cells called pigment cells, which give a more or less dark colour to the surface on which they are developed. These are very abundant in the negro race, but occur also to a greater or less extent in all fair races of men. Albinos are in consequence not confined to the inhabitants of Africa or India, but are found amongst Europeans also; though not so frequently. This variety may be noticed likewise amongst animals, both mammalia and birds, but does not occur in cold blooded animals.

Albione.—A genus of annelides, synonymous with Pontobdella. See ANNELIDA.

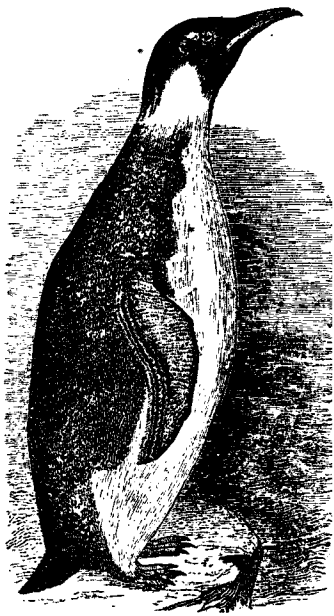
Albite (*albus*, white).—A variety of felspar.

Alcedinidæ. *King-fishers.*—A family of birds belonging to the fissirostral tribe of the order *Passeres*. More than sixty species of this family have been described, chiefly natives of Asia and Africa; all characterized by great brilliancy of plumage. They have a long, straight quadrangular bill, thick at the base, and pointed at the tip. The legs and tail are short. They live on fish, are retired and solitary in their habits, and build their nests in holes on the banks of rivers. The common King-fisher, *Alcedo ispida*, is the only European species, but, as has been well observed, that one is like a gem of the finest water. The resplendent and beautiful azure that adorns the middle of the back, the rump, and coverts of the tail are not surpassed by any birds of the hot climes of Asia or Africa, while orange, green, black, blue, and white, in other parts of the body, unite to render its plumage gay and brilliant. The King-fisher is generally seen flying rapidly near the surface of a stream, and frequently, after hovering over it for a short time, he may be seen plunging into the water with the velocity of an arrow from the bow, and almost immediately reappearing with a fish in his mouth, with which he retires to a little distance to despatch and swallow. This bird was known to the ancients by the name of Halcyon, and many fabulous stories are told of it by the early writers. They supposed that it built its nest upon the surface of the sea amongst the foam of the waves, and that it had the power of calming the troubled deep during the period of incubation. They only sat on their floating nest a few days, and during that short period, which was in the depth of winter, the mariner might, they said, sail in perfect security. Those days were hence termed Halcyon days. The Tartars and Ostiacs, amongst whom this bird, or a nearly allied species, is found, preserve the skin about their persons in a purse, and reckon it a preservative against every ill. The feathers are used by them as love amulets, and they believe that if a woman is touched by a feather which floats on water, she will be induced to fall in love with the person who uses it. The belted King-fisher of America, *Alcedo Alcyon*, is the only species found in the United States. He takes up his position on the brink of a cataract, or over the foam of a torrent, perched upon an overhanging bough, and there, glancing his piercing eye in every direction below for his scaly prey, he plunges amidst the water, sweeps them from their native element, and swallows them in an instant. His peculiar note is a loud rattling "churr," not unlike the twirling of a watchman's rattle. The female builds her nest in clay or sandy banks, in holes which she digs out with her strong and broad feet, and returns to the same nest for several years in succession.

Alcephalus.—A genus of antelopes. See ANTILOPÆ.

Alces. *The Elk.*—A genus of animals belonging to the deer tribe. See CERVINA.

Alcidæ.—A family of sea birds belonging to the order *Palmipedes*, or web-footed birds, the *Anseres* of Linnæus. They are adapted solely for an aquatic life, and all the species are marine. The bill is generally rather short, and sometimes much compressed. The legs are short but strong, and placed so far backwards that, when the birds rest on the rocks, they appear to stand in an upright position. Their food consists of fishes, crustacea, and other marine productions. The species are numerous, and they have been divided by late ornithologists into many genera, including the true Auks, the Puffins, the Guillemots, and Penguins. Amongst the auks, the Great auk, *Alca impennis*, is the most curious. It lives chiefly within the arctic circle, though it has on rare occasions been seen in England. It is about the size of a goose, or nearly three feet long, has exceedingly short wings, not larger than moderate sized fins, and swims with great rapidity, being able to distance a six-oared boat. The Esquimaux make garments of the skins. It lays one egg, which is of a large size, six inches long, and, from its rarity in this country, is much prized by egg collectors. The Razor-bill, *Alca torda*, is a native of high northern latitudes, and is also found in considerable abundance in this country. The eggs are considered a great delicacy, especially for salads. They are deposited upon the bare rock, poised in such a way on the end as no human art can effect, and fixed by means of a viscous moisture which bedews the surface on their exclusion. On the coast of Labrador, where they abound, thousands of these birds are killed for the sake of the breast feathers, which are very warm and elastic, and vast quantities of eggs are also collected. They only lay one, which is very large compared with the size of the bird. The Razor-bill is little more than fifteen inches long, and its egg is about the size of that of a turkey. Amongst the Puffins, the Coulter-neb or common Puffin, *Fratercula arctica*, is the most common species. They are natives of high latitudes, but breed in great quantities in this country also. They lay their solitary egg in burrows made by rabbits, or by the birds themselves, depositing it at the farthest end. The young are eaten in some parts of the country, and considered delicious; they are sometimes potted. Amongst the Guillemots, the common Guillemot, *Cataractes troile*, occurs very commonly in this country. It breeds in vast numbers on the narrow ledges of rocks, where in many places they may be seen sitting in successive rows one over another. They lay only one egg, disproportionately large. The black Guillemot, *Uria grylle*, lays two and sometimes three eggs. The Penguins are even less capable of flying than the auks, and their little wings are covered by mere vestiges of feathers. They are only found in the antarctic seas, never going ashore except to breed. Their bones are permanently filled with marrow. The Patagonian Penguin, *Aptenodytes Patachonica*, is larger than a goose, slate coloured above, white underneath with a black mark, encircled by a citron-yellow



Aptenodytes Forsteri.—Patagonian Penguin.

cravat. The plumage is very close, and this portion of the skin is used as tippets, &c., for ladies' dresses.

Alcippe.—A genus of *Cirripedes*. See CIRRIPEDIA.

Alcyonidæ (*Alcyone*, proper name). — A family of *Zoophytes*. See ANTHOZOA.

Alectrurinæ. — A sub-family of the fly-catchers. See MUSCICAPIDÆ.

Alectrurus. — A genus of fly-catchers. See MUSCICAPIDÆ.

Alepas (*α*, priv.; λεπας, a kind of shell). —A genus of *Cirripedes*. See CIRRIPEDIA.

Aletris.—A genus of plants. See HÆMODORACEÆ.

Algæ (*Alga*, a marine plant).—An order of cryptogamic plants, generally known as sea weeds. See THALLOGENÆ.

Alhagi (from the Arabic *Aghul*, or *Algul*). —A genus of plants belonging to the nat. ord. *Leguminosæ*. The *A. maurorum* is a native of the deserts of Egypt, Syria, Mesopotamia, and other countries of the East, and yields a species of manna. During hot weather it exudes naturally from the leaves and branches of the plant, appearing first in the form of a small drop as of

honey, which goes on increasing in size till it is about as large as a coriander seed. This manna is not imported into this country, but is used at the present day in Persia, and is known by the name of Persian manna. The plant is employed as food for cattle.

Allamonda.—A genus of plants. See APOCYNACEÆ.

Alligator.—A genus of reptiles closely resembling the crocodile. Several species exist, all natives of the New World; and separated by modern zoologists from the genus *Crocodilus*, the species of which are all found in the Old World. See CROCODILUS.

Allium.—A genus of bulbous rooted plants belonging to the nat. ord. *Liliaceæ*, and containing many species, several of which are extensively cultivated now, and have been from the highest antiquity. The common Onion, *A. cepa*, the Leek, *A. Porrum*, and the Garlic, *A. sativum*, are too well known as useful culinary plants to need description. They were known to the Jews, and are mentioned in the Bible. The Shallot, *A. ascalonicum*, the Chive, *A. schœnoprasum*, and the Rocambole or Spanish Shallot, *A. ophioscorodon*, are also commonly used as articles of food. The plants of this genus contain phosphoric acid, and a sulphuretted oil, which is in a great measure dissipated by boiling or roasting. The species are all remarkable for their possessing more or less the odour of garlic. They are chiefly natives of the Northern hemisphere, and are principally found wild in the meadows and groves of Europe, in the north of Asia and the north of Egypt; a few only inhabiting America. Some of them are handsome flowering plants.

Alluvium (*alluere*, to wash upon).—The name given to those accumulations of soil, sand, gravel, &c., brought down by currents of water from higher regions into plains, and generally known by the term alluvial land, or formation. The superior crust of the earth is constantly being disintegrated by the action of the air, by tides, currents, and streams of running water, and deposited at the bottom of rivers, lakes, estuaries, and the ocean itself. In time these lakes, &c., are completely filled up, become dry land, and a valley composed of this alluvial soil is formed. Thus the vast fertile valley between the Vosges mountains and those of the Black Forest, through which the Rhine flows, was at one time, there is every reason to believe, the site of a lake, far larger than the lake of Geneva, and most probably quite as deep.

Alnus. *The Alder.*—A genus of plants belonging to the nat. ord. *Betulaceæ*. Several species are described, all shrubs and trees, and natives of America, Europe, and Asia. The common Alder, *A. glutinosa*, is a well known tree, a native of Europe from Lapland to Gibraltar, of Asia from the White Sea to Mount Caucasus, of North America and of North Africa; growing in swampy lands and moist meadows. The wood forms one of the best kinds of charcoal, and is valuable for piles, pumps, sluices, water pipes, and other works intended to be constantly under water. It is much used by the turner for various implements, and the roots and knots furnish a beautiful veneer wood for cabinets. The bark contains a great abundance of tannin, and is in consequence much employed by tanners. The young shoots afford a yellow dye, which, mixed with a little copperas, gives a yellowish-grey, useful in the demi-tints and shadows of flesh in tapestry. The heart-leaved Alder, *A. cordifolia*, has lately been introduced into this country; it grows very rapidly, and is a very ornamental tree. Its native country is the kingdom of Naples.

Aloe, *The Aloes.*—A genus of plants belonging to the nat. ord. *Liliaceæ*. There are a considerable number of species known, all natives of hot climates; many, objects of curiosity as hothouse plants, but some of much interest as yielding the valuable drug known by the name of *Aloes*. The *A. perfoliata* of Linnæus is the species which was formerly considered to yield the greater part of the drug. The variety *Socotrina*, which by many botanists is made into a distinct species, and is a native of India, particularly the island of Socotra (from which it has derived its name), is considered to produce the most pure and most valuable kind, known by the name of Socotrine Aloes. From the *A. vulgaris* is obtained the Barbadoes or Hepatic aloes. It is a native of India also, but is cultivated in Barbadoes and other West Indian islands. The method of preparing the drug, is to cut the leaves off at their base, and allow the juice to drain. This is then inspissated, or they are cut into slices, and boiled for ten minutes, and the water evaporated. The *A. spicata* is a native of the Cape of Good Hope; and a tract of mountains, about fifty miles from Cape Town, is wholly covered with this plant. The aloes prepared from this species is considered very good, and, indeed, furnishes the greater part of the extract sold in Europe as *Socotrine aloes*. The Hottentots hollow out the trunk of the *A. dichotoma*, also a native of the Cape, to make quivers for their arrows. Amongst the Mohammedans, especially in Egypt, pilgrims, on their return from Mecca, suspend a species of Aloe over their doors, as an evidence of their having performed that holy journey. The superstitious Egyptians imagine that when suspended over their doors it keeps apparitions and evil spirits from their houses; and many Christians and Jews in Cairo use it for this purpose. Aloes was also used amongst the ancients for the purpose of embalming. This is supposed to have been the aloes mentioned by St. John, as having been brought by Nicodemus for embalming the body of Christ. The juice of the Aloe has been used in hot countries as a preservative for their rafters, &c., from the attacks of white ants. The active principle found in aloes is called *Aloesin*. The quantity of aloes entered in the customs for home con-

sumption in England, amounted, on the average of the years 1841-42, to 170,780 lbs. a-year.

Alopecurus (*αλωπηξ*, a fox; *ουρα*, a tail).—*Fox tail Grass.* A genus of plants belonging to the nat. ord. *Gramineæ*, or grasses. One species, the meadow Fox tail grass, *A. pratensis*, is a valuable grass to the farmer if sown in meadow land. It is the most grateful of all the grasses to cattle, and possesses, in a higher degree than any other, the three great requisites of a good grass, quantity, quality, and earliness. The slender or field Fox tail grass, *A. agrestis*, from its fibrous root, is a troublesome weed to farmers amongst wheat, and is called by them *black bent*. It is a useful grass, however, when sown on light sandy soils on the sea coast.

Alosa. *The Shad fish.*—See CLUPEIDÆ.

Alternation of Generations.—The subject of the alternation of generations is one of the greatest importance to zoologists. Besides the extraordinary metamorphoses which insects undergo, and which were known to the ancients, and those which many crustacea exhibit which have been discovered by the moderns, the still more recent researches of some distinguished naturalists have demonstrated the frequent occurrence of even more remarkable changes in many individuals amongst the lower classes of invertebrata. These naturalists have shown that an animal, arrived at mature age, with distinct sexes and of perfect form, and which undergoes during its further life no changes itself, will produce from eggs a brood of young of a totally different generic form from that of their parent, and not possessing sexual organs—that these young, when they have arrived at their mature form, will in their turn produce a progeny which will, after a certain progress in development, return in form and nature to the original type, or what we may call the grandmother. Thus a free swimming acalephe, or medusa, produces from eggs a brood of young which, instead of resembling their parent, have the form and appearance at first of certain ciliated infusoria, but which in their course to maturity become fixed and immovable, and assume a polypiform appearance. These polypiform animals have no sexual organs, but in their turn produce by gemmation a fresh progeny which are free swimming animals with distinctly characterized sexes that never become fixed, but, after a series of changes in their development, assume the original type, or that of the medusæ. This alternation of generations is constant, and the course of development as described above is repeated in regular series during the life of the animal. A similar alternation of generations takes place in the zoophytes. A bell shaped polype or campanularia is observed to have three kinds of cells upon its stem which differ from each other. One of these, which is the smallest, is observed to contain eggs which produce young in the form of ciliated infusorial animals. These, after swimming freely about in the water for some time, at length attach themselves to some body, such as a fucus or sea weed, assume the polypiform state, and become a compound polype or polypidom. The polypes of this polypidom in their turn give origin to the medusoid female cell which produces the ova. We thus see that in their developmental history, the animals belonging to the zoophytes or polypes, and those belonging to the acalephæ or medusæ, are no longer to be considered as forming distinct classes, but become nearly allied to each other. Amongst the intestinal worms, or entozoa, also, we find a similar state of things take place. Some of the fluke worms, or distomæ, which live parasitic in the liver of fresh water snails, produce eggs which give origin to a brood of young in the form of small yellow worms of a cylindrical shape, with a spherical, contracted head, which are found in the viscera, and more particularly in the membranes covering them, of the snail. These little worms have a progeny within them of other worm-like creatures of a more or less elongated oval body, and possessing long tails, and a collar of spiculæ, or small spines, round the neck. These are discharged from an opening in the neck, and are then free and unattached, enjoying for a time the power of locomotion in the water in which the molluscs themselves are found. This second generation has been described as a distinct genus under the name of cercaria, and these little creatures attach themselves to the snail, and lodge themselves in the mucous integument of their body, assuming there a pupa state. In this state they remain for several months, upon emerging from which they penetrate deeper into the skin, and following the course of the aqueous canals of the snail, they at length enter the organs, in which they are found in the perfect form of the distomæ. By following up such inquiries, we find not only that animals which have been described as different genera are in reality only different states of development of the same species, but we find also animals which have been arranged in different classes now appear closely allied to each other. A similar process has been observed to take place amongst the mollusca. The curious animals known as salpæ, which are met with out at sea united into long chains of twenty to forty individuals, and which are also found occurring as separate individuals, have been ascertained to exhibit a similar development. The solitary salpæ never form themselves into a chain, yet always contain a progeny resembling those which do. The chain salpæ, on the other hand, are parents of a progeny of solitary ones, and thus an alternately solitary and associated generation is always the result.

Althæa (*αλθος*, a remedy).—A genus of plants belonging to the nat. ord. *Malvaceæ*. The genus contains a number of species, amongst which is the common marsh mallow, *A. officinalis*, a common European plant, and one which, for its mucilaginous qualities, has been used medi-

cinally in all countries, and from remote antiquity. It is still employed in the form of lozenges, &c. The common holly-hocks, *A. rosea*, and *A. sinensis*, are also well known species, and are cultivated in almost every garden for their beauty, being much esteemed as ornamental plants towards the close of summer.

Alucita.—See ALUCITIDÆ.

Alucitidæ.—A family of small lepidopterous insects, distinguished by the wings being singularly divided into narrow feathered rays. The larvæ are clothed with very long hairs, have sixteen feet, and are very inactive. The pupæ are either naked, and enclosed in a transparent silken cocoon, or conical, hairy, and either suspended perpendicularly by a thread, or affixed at the posterior extremity of the body to a layer of silk or leaves. The species of the genus *Alucita* frequent gardens, and may be seen sitting with their beautiful fan-like wings on hothouses in the day time. The species of *Pterophorus* are evening visitors, and may be seen flying over low plants.

Aluminite.—A variety of native sulphate of alumina, found in reniform masses and botryoidal concretions in Prussia, France, &c.

Aluminium.—A new metal obtained from common clay. It has the appearance of silver, and does not tarnish when exposed to the air. As yet the process for obtaining it is very expensive, but as a new method has been very lately discovered, it is believed that it will be soon obtained at a cheap rate and come into general use. At present it is being manufactured into very *small weights*, such as the hundredth part of a grain, and this promises to be a useful application of it.

Alumo-Calcite.—A species of impure quartz found in Germany, from which alum is obtained, in combination with lime.

Alum Slate.—A rock found in Germany, Sweden, Yorkshire, &c., &c., from which the well known substance called alum is prepared. It contains silica, alumina, and most probably bisulphuret of iron. By exposure to the air it effloresces.

Alum Stone.—A mineral found occurring in Italy, containing alum, and from which the substance called *rock alum* is prepared.

Alveolites.—A genus of fossil corals found in the cretaceous and tertiary strata.

Amadina.—A genus of birds, containing the Java sparrow and Amadavade or Amaduvat finch, and belonging to the family *Fringillidæ*. See FRINGILLIDÆ.

Amadou.—A kind of tinder made chiefly from the fungus called *Polyporus fomentarius*, which grows on the ash, cherry tree, &c. The fungus is dried, steeped in a strong solution of saltpetre, and cut into thin slices. When thick it is beaten with a mallet or hammer, and in Franconia the peasants make dresses of it, when they can obtain pieces large enough; they are soft, supple, and very light. Amadou is obtained from other species of fungi also.

Amaranthaceæ (*a*, priv.; *μαραίνω*, to wither; and *ἄνθος*, a flower).—A family of plants belonging to the apetalous *Dicotyledones*, deriving the name from the flowers being incorruptible, or not withering after being cropped. A great many species are described, most of them natives of the

Celosia cristata—The Cock's-comb.

East Indies or America. Some of them are handsome garden flowers, such as the prince's feather, *Amaranthus hypochondriacus*, love lies bleeding, *A. caudatus*, the cock's-comb, *Celosia cristata*, &c. Several species are used as culinary plants, such as the *Amaranthus oliveaceus*, and the *A. Blitum*, or Chusan Han-tsi.

Amaryllidaceæ.—A family of monocotyledonous plants to which the narcissus, snow drop, &c., belong. They are usually bulbous plants, and the greater number are natives of the Cape of Good Hope, though several species are found in Europe, East and West Indies, South America, and Australia. Many of the plants of this family are handsome ornamental garden plants, but in some there is contained a highly poisonous property which renders them dangerous. The bulbs of the blood flower of the Cape, *Hæmanthus toxicarius*, contain an acrid poisonous juice, which, when inspissated, is used by the Hottentots to smear their arrows. Those of several species of Narcissus, such as *N. poeticus*, *N. Jonquilla*, *N. pseudo-narcissus*, or common daffodil, and some others, contain an acrid emetic property. The Guernsey lily, *Amaryllis sarniensis*, a handsome plant naturalized in the island of Guernsey, is also reputed poisonous. This plant is originally a native of Japan, and is said to have been brought in a Dutch ship from that country, which was wrecked on the coast of Guernsey about the middle of the seventeenth century. The bulb thrown ashore took root in the sandy soil of the island, and have for a length of time been highly prized as a handsome and tolerably hardy flower. The American aloe belongs also to this family. See AGAVÉ. Some of the species secrete a fecula or kind of flour, which, when separated from the juice naturally contained in it, becomes a wholesome article of food. The arrowroot of Chili is

obtained in considerable abundance in this manner from a species of *Alstromeria*, which has fibrous roots instead of bulbs.

Amansite.—A mineral substance; a variety of felspar.

Amber.—A fossil resin of one or more trees belonging to the nat. ord. *Coniferæ*, now extinct. It occurs in various parts of the world, but the greater portion comes to us from the southern coasts of the Baltic, where it is thrown up between Konigsberg and Memel. Amber is harder than other resins, and is susceptible of a good polish. Carbon enters largely into its composition. When rubbed it becomes electrical, and the word *Electricity* is derived from the Greek name for amber, ηλεκτρον. Microscopic fungi, several species of infusoria, and many kinds of insects, &c., are found preserved in amber. It burns with a bright flame, and gives out rather an agreeable smell.

Ambergris. *Ambarum griseum*, or *Ambra grisea*, from the Arabic word *Ambar*.—A substance of animal origin found floating on the sea in warm latitudes. It is now known to be a product of the whale, chiefly of the *Physeter macrocephalus*, or spermaceti whale, and is found in the large intestines of that animal. The best kind comes from the coasts of Madagascar, Surinam, and Java. It is occasionally found in large masses, sometimes of the weight of upwards of 200 lbs. When first found floating in the sea, it is soft and of a very strong smell, which diminishes by degrees, as it hardens by exposure to the air, and ultimately becomes highly aromatic. The active principle contained in ambergris is called *Ambrein*. Ambergris is chiefly used as a perfume, generally in the form of an alcoholic solution. The Orientals use it as an aphrodisiac, and esteem it highly. It has also been used in nervous diseases.

Amblyrhynchus.—A genus of lizards resembling the iguanas, found in the Galapagos islands. They are very ugly animals, but harmless. Some of the species live on the rocky sea shore, and are of aquatic habits, feeding on sea weeds. Others live entirely on land, inhabiting burrows excavated between fragments of lava. These feed on the leaves of trees, &c., and their flesh is considered a delicate kind of food.

Amethyst.—A precious stone met with in various parts of the world, as India, Siberia, Spain, Germany, &c. The mineral called Oriental amethyst is a variety of adamantine spar, and is essentially different from the real occidental, or common amethyst, which is a variety of quartz or rock crystal. The colour is purplish-violet, varying throughout every shade. It consists of silica, alumina, and oxide of iron, and manganese. It has been much used by jewellers to set in rings, brooches, &c., and as amethysts are the only coloured stones except garnets that are worn with mourning, they still retain a distinguished rank amongst gems.

Amentaceæ. *The Catkin bearing plants.*—An extensive order of plants, the flowers of which are arranged in a dense cylindrical deciduous spike called *Amentum*. This order contains nearly twenty genera, and upwards of six hundred species, but as the genera are constructed in very different manners, they have now been arranged in several sub-orders or families—such as SALICACEÆ, or the willow family, BETULACEÆ, or the birch family, CORYLACEÆ, or the hazel family, &c., &c. See these words.

Amentum or Catkin of Corylus ave

Amianthus (αμιαντος, undefiled); *Asbestus* (ασβεστος, inextinguishable,) or *Mountain Flax*.—A mineral substance occurring in long capillary crystals placed side by side in parallel position, and thus forming a fibrous mass, flexible and elastic. It is a variety of the *Tremolite*. There are two kinds of this mineral. The one, which is composed of very delicate and regularly arranged fibres which are very flexible, is called *Amianthus*; the other, in which the fibres are coarser and of little flexibility, is called *Asbestus*. The amianthus is inconsumable by a high degree of heat. The ancients possessed the art of drawing the fibres into threads, and then weaving them into cloth, which was able to resist the action of fire. Pliny mentions having seen napkins made of this kind of cloth which, when soiled, were thrown into the fire to be cleaned! A cloth of this substance was employed by the ancients to wrap their dead in previously to the bodies being exposed on the funeral pile. It is found in many places. Corsica is the place where it occurs in the greatest abundance, but it is found also in Cornwall, some parts of Scotland, and in the United States of America, where it is occasionally used as a wick for lamps.

Amiba. · AMÆBA, *Ehrenberg*; PROTEUS, *Muller*; (αμοιβη, changing.)—A genus of animals belonging to the class *Infusoria*. The

amibæ are found in all old infusions which have not become putrid, or in the muddy deposit which takes place on plants which have for some time been submerged either in fresh or sea water. They are of a glutinous substance, without any external covering, and apparently so simple in their organization, that though their transparency is so great as to permit their structure to be seen intimately, no distinct or special organs can be distinguished belonging to them. They are remarkable for constantly changing their form, and it is by frequent variation of figure that they accomplish the act of locomotion. At first they look like a small round immovable mass, semi-transparent, or presenting the appearance of a slight nebulosity. If we watch the creature for some time, we see a perfectly transparent expansion or rounded globe issue from the circumference of this mass and glide along like a drop of oil; then fixing itself by a point draw the whole mass slowly along. These variable expansions, as they are called, never continue any length of time, but are retracted immediately and lost in the mass, to be extended again the next instant. They vary much in different species. Sometimes they are as broad as the original mass. At others they are narrow and longer, but still rounded at the extremity. In some species they are terminated in a point. In others they are slender, nearly filiform, simple or bifid, or even branched. Adult specimens become opaque in the centre from an agglomeration of corpuscles or granules, which have been by some supposed to be eggs, but the real nature of which it is difficult to make out. The chief manner in which they multiply themselves is by what is called spontaneous division, where the body separates itself into two or more portions, or more frequently still by the animal parting with a lobe which assumes a separate existence, and continues to live on its own account. A considerable number of species have been described, but it is extremely difficult properly to characterize animals which assume such Protean appearances as the amibæ do.

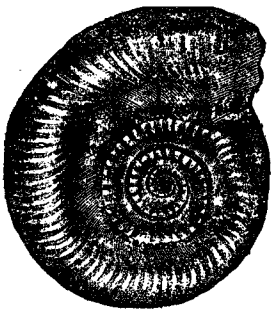
Ammodytes (*αμμος*, sand or mud; *δυτης*, plunger).—A genus of apodal malacopterygious fishes belonging to the family *Anguillidæ*. Two species occur in England, one of which is called the sand eel, *A. tobianus*, and is much esteemed both as a bait by fishermen, and in many places, especially in the Channel Islands, as an article of food. They are eaten either fresh, or dried in the sun and grilled. Another species often confounded with the sand eel, called the launce, *A. lancea*, is even more common, and is used in the same manner as the other. They burrow in the sand, at low water, to the depth of from four to six inches, and form part of the food of the mackerel and salmon.

Ammoniacum.—A concrete fetid gum resin obtained from a plant, *Dorema Ammoniacum*, belonging to the nat. ord. *Umbelliferæ*, and resembling fennel, a native of the north of Africa, Arabia, Persia, India, &c. It contains resin, gum, and volatile oil, and is used medicinally as a stimulant, antispasmodic and expectorant. The best is brought from Persia by Bombay and Calcutta.

Ammonites.—See AMMONITIDÆ.

Ammonitidæ.—A family of extinct fossil mollusca, belonging to the tetrabranchiate order of the class *Cephalopoda*. The name of Ammonite given to the typical genus is derived from *Ammon* or Jupiter, who was worshipped in Lybia under the form of a ram. The form of the shell is that of a ram's horn, and they used to be called *Cornua Ammonis*, and at one time were considered to be really petrified rams' horns. Internally, the shell is divided into cells or chambers by a series of partitions connected to each other by a tube or syphon, as in *Nautilus*, which is the only living representative of the order to which the ammonites belong. See NAUTILUS. The syphon, however, in the Ammonites is close to the outer margin of the shell, or is described as external, while in nautilus it is central or internal. When the outer shell is removed, the edges of the partitions, or *septa*, are seen forming covered zigzag or foliaceous lines, and afford good specific characters. The structure of the shell of the ammonitidæ is exactly that of the nautilus, consisting of an external porcellanous layer, and an internal nacreous lining. The last chamber, in which the body of the animal must have been lodged, is elongated, and the aperture was guarded by processes and closed by an operculum or lid. This operculum, similar in function to that of the gasteropods, has been described by different authors as a distinct genus of fossils under the names of *Trigonellites, Aptychus*, and *Munsteria*. The ammonitidæ are believed to have been chiefly instrumental in a former period of the earth's existence to keep molluscs, crustaceans, &c., within bounds, for they are most widely distributed, and must have been exceedingly abundant. They are found in Europe, Asia, and America, chiefly in the oolitic and chalk formations. Species have been found in the high passes of the Himalaya mountains, 16,000 feet above the sea, similar to some discovered in the oolite series of rocks in this country. In some parts of the world they are so numerous that the rocks seem wholly formed of them, and in Burgundy the roads in some places are altogether paved with them. Twelve genera belonging to this family have been described. The genus *Ammonites* has a regular spiral and discoidal shell, and no fewer than 530 species have been enumerated. In India they are known by the name of *Salagraman*, and are objects of superstitious veneration amongst the Hindoos, who believe that one of their gods is concealed inside. They obtain a large size, and specimens are found measuring four feet in diameter. *Crioceras* has the shell discoidal, but the whirls instead of being close together are separated from each other. Nine species have been described.

Toxoceras has the shell bow shaped like an ammonite uncoiled, or like the horn of an ibex.



Ammonites striatulus.

Nineteen species are known. *Ancyloceras* has the shell at first discoidal with separate whirls, afterwards produced into a straight line, and then bent back again like a hook or a crosier. Thirty-eight species have been enumerated. *Scaphites* has the shell at first discoidal and the whirls close together, the last chamber being detached from the rest and bent backwards. Seventeen species have been described. *Helicoceras* has the shell spiral, the whirls separate, few in number, sinistral, and resembling much a spiral sheep's horn. Eleven species are described. *Turrilites* has the shell spiral, sinistral, more or less turreted, the whirls close together, and the aperture often irregular. Twenty-seven species have been described. *Hamites* has the shell hook shaped instead of being spiral, and bent upon itself more than once, the courses being separate. No fewer than fifty-eight species of this curious genus have been enumerated. In *Psychoceras* the shell is bent once upon itself, and the two straight portions are in contact with each other. Seven species are known. *Baculites* has the shell straight, elongated, the whirls close together, and the aperture guarded by a dorsal process. Eleven species have been described, and their abundance is so great in Normandy that the chalk there has received the name of Baculite limestone.

Ammophila (*αμμος*, sand; *φιλεω*, to love).—A genus of grasses. See ARUNDO.

Amomum.—A genus of plants. See ZINGIBERACEÆ.

Amorpha.—A genus of plants belonging to the nat. ord. *Papilionaceæ*. One species which is now cultivated in our gardens and shrubberies in this country, *A. fruticosa*, is a native of Carolina, and is called there the bastard indigo. It was formerly used by the inhabitants to make a coarse kind of indigo—hence its name.

Ampelidæ. *Chatterers.*—A family of birds belonging to the dentirostral tribe of the order *Passeres*. They are characterized by having the bill short, strong, broad, somewhat depressed at the base, and more or less curved at the tip, where the upper mandible is bent down and notched. Gape wide, generally without bristles; tarsi short and strong; claws very strong, and tail often very short. The greater number of these birds are natives of America, and live on fruits and berries. The habits of but few are well known, though many species are described. Only one genus is European, the *Ampelis*, or wax-wing; and the species are distinguished amongst their congeners by their possessing some small, flat, oblong appendages on the wings, resembling in colour and substance red sealing wax. Only one species of this genus is found in Europe, the *A. garrula*, European wax-wing, or Bohemian chatterer. It is an occasional though irregular visitant of this country, but in Northern Russia, and the extreme north of Norway, they are said to be seen in great numbers every winter. Still their real native country is unknown—where they breed and bring up their young. It has been conjectured that their chief place of abode will be found in the extensive, elevated table land of Central Asia. They do not deserve the name *Chatterers*, as, on the contrary, they are generally very silent. They are easily tamed, and their flesh is said to be excellent eating. The American wax-wing, or cedar bird, *A. carolinensis*, is common in North America, where, in the fall and beginning of summer, it becomes very fat, and is then much esteemed for the table. They breed in June, building a large nest, and laying three or four eggs. Another species inhabits Japan. The Cotinga, *A. cotinga*, or *Cotinga cœlestis*, is a native of Brazil, and is a beautiful bird, the head and upper parts of the body being of a fine blue, the throat, neck, and breast, purple, varied with patches of bright scarlet. This species and an allied one were introduced into Europe by Madame Pompadour, the mistress of Louis XV., and are hence called *Pompadour Chatterers*.

Ampelideæ.—A family of plants. See VITACEÆ.

Ampelis. *The Wax-wing.*—See AMPELIDÆ.

Amphibia (*αμφιβιος*, having a double life).—A term usually applied to designate those animals which are able to live either in air or under water at pleasure. Of all the creatures, however, to which this name has been applied, to scarcely one of them is it applied correctly. To be truly *amphibious*, it is necessary that the animals should have *lungs* and *gills* at the same time. Whales, seals, &c., which were at one time called amphibious, are possessed of lungs only, and can live for only a short time under water, being obliged to come to the surface at frequent intervals to breathe. Frogs, salamanders, &c., to which the name has more recently been restricted, are equally, when adult, possessed of lungs only, and must come to the surface to respire. It is only then to the genera *Lepidosiren*, *Proteus*, *Siren*, the *Axolotl*, and *Menobranchus*, that the term *amphibious* really applies, as these animals pos-

sess in reality both lungs for respiring atmospheric air, and gills to enable them to extract air from the water. They can thus live at pleasure either in the air or under the water. Modern zoologists, however, use the name *Amphibia* to designate as a distinct class, not only these true amphibians, but frogs, salamanders, and all those animals classed by Cuvier, as an order of reptiles, under the name Batrachians. See Batrachia.

Amphibola.—A genus of marine, air-breathing mollusca, the species of which are only found in the Pacific Ocean. They are eaten by the inhabitants of New Zealand, where they occur plentifully.

Amphibole (*αμφιβολος*, ambiguous). — A genus of minerals. Sea Augite.

Amphioxus. *The Lancelet.*—A genus of chondropterygious fishes, related to the lampreys, and of which there is only one species, *A. lanceolatus.* The structure of this creature is the most anomalous of all the animals of the class to which it belongs. It is about two inches in length, of a lanceolate form, tapering to each extremity, and riband-like, the head being scarcely distinguishable from the body. The entire animal is translucent and of a silvery whiteness. The vertebral column consists of a series of from sixty to seventy very rudimentary vertebræ, and does not show the slightest vestige of a cranium. The spinal marrow extends the whole length of the column, but presents no trace of a brain. The respiratory apparatus is more that of an ascidian mollusc than a fish, and the intestinal canal is ciliated. This curious fish lives in sandy ground at a depth of between twelve and twenty fathoms water; and is a native of Great Britain and the Mediterranean. It swims rapidly with a snake-like motion. Its food consists of infusoria.

Amphipoda (*αμφι*, all round; and *ποδ-ος*, foot).—An order of sessile-eyed *Crustacea.* See Edriophthalma. This order contains a considerable number of species, all of small size. The branchiæ, or gills, are in the form of large membranous vesicles placed at the base of the feet, on their inner side. The thorax is generally divided into seven moveable rings, and the thoracic, or true feet, are seven pairs. The abdomen is large and well developed, and the members, or false swimming feet attached to it, are elongated, narrow, and fringed with hairs. The three hinder pairs are bent backwards, and along with the terminal portion of the abdomen, form a sort of fin which serves the animal for swimming or leaping. The females carry their eggs under the thorax, between certain scales or vesicles which form a kind of pouch. In this position they are hatched, and the young remain attached to the legs, or other parts of the body of the parents, until they gain sufficient strength to swim and take care of themselves. Some of the species are parasitical, living attached to fishes, and in medusæ or acalephæ, as *Phronima*, one or two species of which are European, and are found inhabiting the interior of a gelatinous, transparent, bell-like bag, open at both ends and formed probably of the body of a beroe; others are free and very active, some living in the sand of the sea shore, others in the sea or in fresh water, as the sandhoppers, *gammarus.* They swim on their side when in the water, and when on the sand they leap with great force and agility. They abound on some parts of our sandy shores, to such an extent, that they are seen to produce a sort of mist or cloud in the air, on the horizon, as they leap up in myriads from the beach.

Amphisbæna (*αμφις*, both ways; and *βαινω*, to walk).—A genus of reptiles. See Amphisbænidæ.

Amphisbænidæ.—A family of reptiles belonging to the order *Amphisbœnia* of Gray, natives of South America, and distinguished by their bodies having nearly the same uniform thickness throughout their whole length. Their head is so small, and the tail so thick and blunt, that it is difficult at first sight to distinguish one from the other; and this has given rise to the belief that they have two heads, and have the power of walking backwards or forwards with the same facility. They are harmless, living chiefly in ants' nests, upon which animals they feed. Their eyes are very small, hence they have been supposed to be blind. The species of the genus *Amphisbœna* are destitute of limbs, but the genus *Chirotes* is peculiar for having two small rudimentary front legs.

Amphitoites.—A genus of fossil zoophytes, which occurs in the quarries of Montmartre. The species are all quite extinct, as they do not even approximate to any recent genus of zoophytes known to exist.

Amphitrite (*αμφιτριτη*, a proper name—the wife of Neptune).—A genus of annelides. See Annelida.

Amphisma.—A genus of animals belonging to the class *Amphibia.* See Pseudosauria.

Ampullaria (*ampulla*, a globular flask).—A genus of mollusca. See Ampullariidæ.

Ampullariidæ.—A family of the podophthalmous gasteropodous *Mollusca*, the species of which live in the fresh waters of India, Africa, and South America. In addition to their gills, they are said to have a bag which opens beneath, placed on the side of the respiratory cavity, which they can probably fill with water. It is most likely by means of this apparatus that the animals have the power of surviving a long drought or removal from the water, individuals having been known to have lived after having been packed up dry for a year or two. Their eggs are large, enclosed in capsules, sometimes of a pale green colour and agglutinated in globular masses. One of the species is found living also in the salt water lake Mareotis. They are possessed of an operculum, which varies in form and struc-

ture, and thus furnishes good generic characters. Some, as *Ampullaria*, have a thick shelly internal coat to the operculum. In *Pomus* and *Lanistes* the operculum is simply horny.

Amygdaleæ.—A sub-order of plants of the nat. ord. *Rosaceæ*. It is distinguished from the other sub-orders of this great family by the fruit being what is called a drupe, hence it is called *Drupaceæ* by Lindley. Another peculiarity distinguishing this sub-order is, that the leaves, kernels, and flowers, contain hydrocyanic or prussic acid. The plants are therefore more or less powerful poisons, though the fruits of most are not so, but on the contrary much esteemed. Such is the fruit of the common almond, *Amygdalus communis*, which is a native of the North of Africa and of Asia, and now extensively cultivated in the South of Europe. There are two varieties, the var. *dulcis* or sweet almond, and the var. *amara* or bitter almond. There are several kinds of sweet almonds, as the Valentia, Italian, and Jordan, which latter is imported from Malaga. The bitter almond is imported from Mogadore. It contains a bitter azotized principle called *Amygdaline*, which contains hydrocyanic acid, and gives the peculiar aroma to the bitter almond when mixed with water. The sweet almond is of very considerable value as an article of trade, both as regards the fruit itself, and the oil expressed from it, and its cultivation is of great moment in some parts of the South of France and Italy. The average of the years 1840-41, gives 8,019 cwt. as the amount of almonds imported into England yearly. A variety, *sylvestris*, is cultivated in England for the beauty of its flowers, which appear early in spring before the leaves. A well-grown almond tree, covered with its beautiful pink blossoms, is one of the most elegant objects in nature. A well known and highly valued fruit is the produce of another species of amygdalus. The peach is the drupe of the *A. Persicus*. The Romans are said to have obtained the peach tree from Persia, though its native country is unknown. It has been cultivated from time immemorial in Asia, and has been adopted by almost every nation of Europe, and now flourishes abundantly in America. There are two varieties, the peach, with a downy fruit, and the nectarine, with a smooth fruit. The leaves of the peach tree contain a similar principle to that of the fruit of the bitter almond, and the flowers exhale a similar odour. The plum, *Prunus*, and cherry, *Cerasus*, belong to this sub-order. The fruit of the *Prunus domesticus*, when dried, constitute prunes; while the kernels of several species of cherry are used to flavour Ratafia, cherry brandy, Maraschino and Noyau. The laurels, *Prunus Laurocerasus*, cherry or bay laurel; and *Prunus Lusitanicus*, or the Portugal laurel, which contain much hydrocyanic acid, especially the younger leaves, and are highly poisonous in consequence, belong likewise to this sub-order. They have been sometimes used medicinally.

Amygdalus.—See AMYGDALEÆ.

Amygdaloid (*αμυγδαλη*, almond; *ειδος*, form).—A variety of trap rock, containing embedded in it a number of bodies like almonds in a cake.

Amylum (*αμυλον*, starch).—Starch is a product of vegetables in general, which is laid up as a store of nourishment, and undergoes changes at certain periods of the plant's life, which fit it for further use in the economy of vegetation. Starch till lately has been believed to be a vegetable product only, and not to be found in animal cells. It occurs in the form of granules of a white and brilliant appearance. Some plants, such as the potato, arrowroot, sago palm, wheat, &c., contain a great deal of starch. It possesses the property of absorbing a very large quantity of water. When placed in warm water it swells into a gelatinous mass well known in domestic economy as starch—the raw starch then occupying more than thirty times its original volume. In the preparation of starch for household purposes it is necessary to mix it *briskly* in water of a pretty high temperature. Ten grains of amylum in the raw state mixed *rapidly* in 200 grains of water of the temperature of 100° will furnish a quantity of starch equal to that produced by mixing fourteen grains *slowly* in an equal quantity of water at the same temperature.

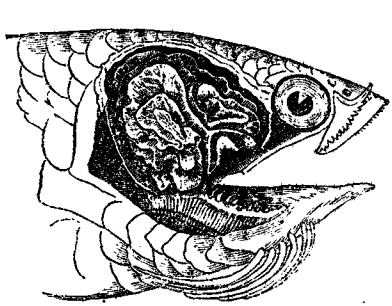
Amyridaceæ. A nat. ord. of dicotyledonous plants, remarkable for yielding various fragrant resins, as myrrh, frankincense, &c. The species are all natives of tropical India, Africa, and America. The gum Elemi which contains a stimulant volatile oil, is the produce of several allied species, probably all referred by Linnæus to the *Amyris elemifera* of Carolina and Brazil. The gum resin Olibanum, or the true frankincense of the ancients and of the Bible, is supplied by *Boswellia serrata*. Myrrh, a bitter aromatic gum resin, employed medicinally, and used in ancient times as frankincense, is derived from a shrub growing in Abyssinia, the *Balsamodendron Myrrha*; the celebrated balsam called Balm of Gilead is the product of another species, the *Balsamodendron Gileadense*, and the Opobalsam of commerce so much prized by the wealthy of Mecca and Constantinople, and which is frequently used by the Egyptians as a remedy for the plague, is derived from the *B. Opobalsamum*; while the Bdellium and the Tecamahac are procured from other plants of this order. The *Amyris (Icica) ambrosiaca*, which grows in Guinea to the height of thirty feet, exudes a very odoriferous balsam wherever the trunk or branches are wounded. It has been used for burning as a perfume in churches, and the tree is called by the French "Arbre de l'encense." The tree known in Jamaica by the name of the white candle wood, and which is esteemed in that island as one of their most

valuable kinds of timber, is a species of amyris, *A. balsamifera*. All parts of the wood are so full of warm aromatic particles that it has been used in warm baths and for fomentations. *Amyris toxifera*, on the other hand, a native of Carolina, distils from the trunk a liquor as black as ink, which is said to be poisonous. It is called by the inhabitants the poison ash.

Amyris.—See AMYRIDACEÆ.

Anabas (*ανα*βαινω, to ascend).—A genus of fishes. See ANABASIDÆ.

Anabasidæ.—A family of fresh water fishes called wandering or climbing fishes, belonging to the order *Acanthopterygii*. The species generally resemble in form the perches, but have a peculiar formation connected with their gills, which essentially characterizes them. The upper membranes of the pharynx are divided into numerous irregular lamellæ, forming small cells in which the fish can retain a quantity of water, by ejecting a portion of which at pleasure these animals can moisten their gills when they are left on the dry land. They all have the power of leaving the water and creeping about on shore, being able by means of the above described apparatus to keep their gills moist for a length of time. *Anabas scandens*, the climbing perch of India, quits the water and wanders over banks,



Respiratory organs of *Anabas Scandens*—The Climbing Perch

&c., for a considerable distance, and is said even to climb trees and bushes! *Osphromenus Olfax*, the gourami, is about the size of a turbot, and is considered even more delicate eating. The female digs a cavity in the sands for the reception of her eggs. The *Ophicephali* are found in India and China; and one species is frequently made use of by the jugglers there to amuse their audience by making it crawl along the dry ground. The greater number of the fishes of this family are natives of Asia, a few only being found in Africa.

Anableps (*ανα*βλεπω, to look up). — A genus of fishes belonging to the order *Malacopterygii* and the family *Cyprinidæ*. The eyes are prominent, and the cornea and iris being divided by transverse bands, the fish has the appearance of possessing four eyes. The only species known, *A. Tetropthalmus*, is a native of Guiana and Surinam.

Anacardiaceæ.—A natural order of plants belonging to the class *Dicotyledones*, consisting exclusively of woody plants abounding in an acrid sometimes caustic resin, and inhabiting chiefly the tropical parts of America, Africa, and India. The fruit of some of the species is edible, and much esteemed. The *Anacardium occidentale*, a native of the West Indies, furnishes the well known cashew or acajou nut, which is much used by the inhabitants as an article of food. The shell abounds in a black caustic oil which has been applied occasionally to remove corns and warts, and to cure ringworm, cancerous ulcers, &c. The plant itself is a handsome tree, twelve or sixteen feet high, and the stem exudes an excellent kind of gum. The delicious fruit called mango is the produce of *Mangifera Indica*, and is esteemed one of the finest fruits of India. The pistachio or pistacio nut is another edible fruit, the produce of *Pistacia vera*, which extends from Syria to Bokhara and Cabul, and is now cultivated in the south of Europe. The hog-plums of the West Indies are the fruit of two or three species of *Spondia*. Several of the plants of the family supply good varnishes, such as some of the species of the genus *Rhus*, the juice of which is very acrid and irritating. The celebrated black varnish called Japan lacquer is the produce of *Stagmaria verniciflua*, and a marking ink is obtained from *Semecarpus Anacardium*, or marking nut tree. The well known Chian turpentine is an exudation from *Pistacia Terebinthus*, a tree which attains the height of thirty or thirty-five feet. It is a native of the southern part of Europe, and the northern part of Africa, and thrives well in the island of Chio or Scio. One tree will yield ten oz. of resinous matter. Mastic is the produce of *Pistacia Lentiscus*, a bush ten or twelve feet high, growing on the coast, and in the islands of the Mediterranean.

Anacardium (*ανα*, without; *καρδια*, heart). —See ANACARDIACEÆ.

Anacharis.—A genus of flowering plants, the species of which grow in ponds and streams of fresh water. A species of this genus, a native of North America, has lately been accidentally introduced into this country, and though only noticed for the first time in 1842 has already spread over a great part of England and Scotland; and in streams, such as the Ouse and Cam, and in canals, such as the canal between Oxford and Ashby de la Zouche, has increased to such an extent as materially to impede navigation, and threatens to injure the drainage. It grows in dense tangled submerged masses of considerable extent, and is so heavy that when cut, instead of rising to the surface and floating to the sea like other weeds, sinks to the bottom. It is this property that is likely to make it injurious to the drainage. The stems are very

brittle, so that whenever the plant is disturbed, fragments are broken off, each of which is capable of becoming an independent plant. Its powers of increase are thus prodigious.

Anagallis. *Pimpernel.*—A genus of dicotyledonous plants belonging to the nat. ord. *Primulaceæ*. Several species are described, some of them very pretty. The common pimpernel, *A. arvensis*, a little trailing plant, with a pretty scarlet flower and violet mouth, is common in our fields, and is well known as the "poor man's weather glass." The flowers open about eight o'clock in the morning, and close in the afternoon, and they are so sensitive to light, that in cloudy weather, especially when there is moisture in the air, they remain closed altogether.

Anamirta.—See COCCULUS.

Ananassa. *The Pine Apple.*—See BROMELIACEÆ.

Anarrhicas.—A genus of acanthopterygious fishes closely allied to the blennies, but having no ventral fin. The sea wolf or sea cat, *A. lupus*, is common in the north seas, and is a frequent visitor on the east coast of Scotland. It attains the length of six or seven feet, and is a very repulsive animal. The mouth is armed with formidable teeth of two kinds, conical incisors and flat grinders, and its strength and activity render it formidable. It destroys the fishermen's nets, and when attacked defends itself with great vigour. The flesh is like that of the eel, and though its ugly appearance renders it disgusting, it is in reality very good eating. The Icelanders salt its flesh for food, make use of its skin as shagreen, and make soap from its gall. It feeds upon crustacea and shell-fish, which it breaks down with its powerful teeth.—The species of *Anarrhicas* have no air bladder.

Anas. *Duck.*—See ANATIDÆ.

Anastatica (*ἀναστατος*, resuscitating).—A genus of plants belonging to the nat. ord. *Cruciferæ*. One species, *A. hierochuntina*, is known by the name of the "rose of Jericho." It is a native of Palestine and Egypt on the coasts of the Red Sea, and is remarkable for the hygrometric property the dried woody stem possesses of reviving when placed in water. Drifting about in the dry deserts of Syria it rolls up like a ball, but as soon as rain falls it resumes its original appearance. The monks used to term it *Rosa Mariæ*, and asserted that the flowers open on the night in which our Saviour was born. A dried plant when set for some little time and kept moist, will dilate and open so as to disclose the seed vessels and seeds; no doubt it was owing to their knowledge of this fact that the monks were enabled to make the assertion.

Anatherum.—A genus of grasses. See ANDROPOGON.

Anatidæ. *Duck Family.*—An extensive family of birds belonging to the order *Anseres*, containing the geese, swans, ducks, flamingoes, mergansers, &c.

Anatinæ.—A sub-family of the anatidæ, containing the ducks, properly so called. There are many species now known to exist, inhabitants of various parts of the world, generally seen on lakes and rivers in the interior, but sometimes also on the sea shore, and living on vegetables, grains, insects, and shell-fish. The common wild duck or mallard, *Anas boschas*, is the original stock of our tame or domesticated duck. The flesh of the wild duck is highly esteemed as an article of food, and, as the species is in many places very abundant, immense numbers are annually killed for the table. They are caught in great numbers by *decoys*. Pennant had an account of the produce of ten decoys in England sent to him, and in one winter the birds caught amounted to 32,200. In Picardy, in France, where they are likewise abundant, vast quantities are taken in the same way. In one season, 30,000 francs have been paid for the produce of one small lake. In North America too, and in China, immense numbers are annually killed for food. The tame or domesticated duck is a very valuable bird, as contributing to man's subsistence. Ducks are reared with greater facility than almost any other domesticated fowl, as they subsist on scattered corn, the refuse of vegetable and animal substances, worms, snails, and insects. They lay a great number of eggs annually, and the ducklings are easily fattened. The muscovy or musk duck, *Cairina moschata*, so called from its musky smell, originally a native of America, is now domesticated with us. They are more prolific, and sit oftener than other ducks, and being much larger, are reared in our poultry yards for their size. The shieldrakes, *Tadorna*, belong also to this sub-family. The common shieldrake, *T. vulpanser*, is common on the shores of the North Sea and the Baltic, and nestles generally in deserted rabbit burrows. Closely allied to this sub-family are the pochards and eider ducks. Of the former, several kinds are found in this country, and one, the canvas back, is a native of North America. This bird, *Aythya Vallisneria*, is two feet long and three feet wide, and weighs three pounds. They are much relished in the United States, and fetch a high price. Of the eider duck, *Somateria*, two species are abundant in the frozen regions of the north, as Iceland, Lapland, Greenland, and Spitzbergen, and on the shores of Baffin's and Hudson's Bays; and to the inhabitants of these countries they are exceedingly valuable, as affording an excellent article of commerce. This is the fine down called *eider down*, which is taken from the breast of the female when alive and sitting on her eggs. When brought to market it is in balls of the size of a man's fist, weighing from three to four pounds, and the down is so fine and elastic, that when opened and held near to the fire to expand, one ball would completely fill a quilt five feet square. The flesh of these birds is not good, but the eggs are con-

sidered capital eating. The scoters, *Oidemia*, form another genus. The flesh of the *Oidemia Nigra* or black scoter is so very fishy, that the Romish Church exempts it from the interdict which forbids catholics the use of animal food in Lent.

Anchusa. *Alkanet.*—A genus of dicotyledonous plants belonging to the nat. ord. *Boraginaceæ*. The root of one species, the dyer's bugloss or alkanet, *A. tinctoria*, yields a fine deep red colour, which it imparts to oil, wax, and other unctuous substances, as lip-salve, &c. It is also used to dress mahogany and rosewood, to dye cotton, &c.; and dishonest wine merchants employ it to colour some of the beverages sold by them as port wine, and even stain the corks to be used in the bottles. The alkanet is a native of the Peloponnesus, the island of Cyprus and neighbourhood of Alexandria; but is imported, though not in considerable quantities, from the south of France and Spain. It is common in our gardens.

Ancyloceras (*αγκυλος*, incurved; *κερας*, a horn).—A genus of fossil cephalopodous mollusca. See AMMONITIDÆ.

Andira.—A synonym of Geoffræa.

Andræa.—A genus of inoperculate acrocarpous (terminal fruited) mosses, several species of which are British, growing in rocky, usually alpine, districts.

Andrena, Andrenidæ.—A genus and family of hymenopterous insects allied to the genus *Apis*, from which they may be known by their not having an elongated proboscis. The species are very numerous, and make their appearance in the spring and early summer months. They form their nest in the ground, especially in what has been well trodden down, and sometimes burrowing a considerable depth. They do not live in society like the hive bees, but are solitary, and consist only of males and females.

Andrias (*Scheuchzeri*).—A species of fossil Batrachians. See BATRACHIA.

Andromeda.—A genus of plants. See ERICACEÆ.

Andropogon (*ανηρ*, of a man; *πωγων*, a beard).—A genus of grasses. There are a good many species, most of them natives of warm climates, and many possessing odoriferous qualities. *A. muricatum*, a native of India, is called by the natives khus-khus. The roots are very fragrant, and are used by the Indians for making *tatties* and covers for palanquins, &c. When moistened with water and placed in the doorway or window, and exposed to the wind, the tattie (a framework made the size of the door or window, the centre constructed of the roots of this grass intertwining in all directions), renders the room delightfully cool and fragrant. It is also known by the name of vetiver. This species is placed now in another genus, under the name *Anatherum*. *Andropogon nardus* is one of those plants which the ancients designated by the name of spikenard, and which was formerly held in such high repute. It is highly aromatic and exciting. *A. Schœnanthus* has very aromatic leaves, roots, and stalks, which at the present time are used in the composition of some complicated pharmaceutical preparations, such as theriaca and diascordium.

Anemone (*ανεμωνη*, from *ανεμος*, the wind).—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*, and commonly called *wind flowers*. The genus contains many species, most of which possess an acrid property, like the root of the *Ranunculi*. Some of them are great ornaments to our fields, and others to our gardens, in the early months of spring. The hepatica, *A. hepatica*, is remarkable from the flower lying a whole year complete in all its parts within the bud. It flowers early, before the leaves are unfolded. The common garden anemone, *A. coronaria*, is originally a native of Asia Minor and of the south of France, Italy, and Greece, but is now cultivated in our gardens for its beauty. The wood anemone, *A. nemorosa*, is one of our prettiest early spring flowers, and in many of the woods of this country the ground is almost covered with the blossoms in March, April, and May. It is poisonous to cattle when eaten by them. The pulsatilla or pasque flower, *A. pulsatilla*, is more rare, but occurs wild in this country also, and its large purple flowers and finely cut hairy leaves render it a handsome species.

Anencephalus (*α*, priv.; *εγκεφαλος*, brain).—A name given to those monsters which are characterized by the want of a brain, and more or less total want of a spinal marrow. There are two kinds—one characterized by the vertebral column being open, and the spinal marrow totally wanting; the other, by the vertebral column not being open, and the spinal marrow being absent only in the upper or cervical portion. These monstrosities are more common in the human species than in the lower animals.

Anentera (*α*, priv.; *εντερον*, intestine).—A name given by Ehrenberg to designate a tribe or division of the infusorial animalcules belonging to his *Polygastrica*. He supposes the creatures belonging to this tribe to have several stomachs placed round the opening of the mouth or pharynx, but having neither intestines nor anus. See INFUSORIA.

Anethum.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*. The species yield a volatile oil.—The common dill, *A. graveolens*, was formerly much used in medicine; the seeds are moderately warm and pungent to the taste, and of an aromatic smell, and were considered carminative.—The common fennel, *A. Fœniculum* = *Fœniculum vulgare*, is now naturalized in this country, and the leaves are used as sauce for some kinds of fish, as mackerel, &c. The seeds of the fennel were at one time considered an excellent medicine. They are carminative.

Angelica.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*.—The species of this genus are not of much esteem with the exception of the *A. Archangelica* = *Archangelica officinalis*, or garden angelica. This is a native of the northern parts of Europe, and occurs also wild in England. It is much cultivated on the continent for its agreeable aromatic odour. The blanched stems are candied by the confectioners, and form a very pleasant sweetmeat possessing tonic and stomachic qualities. The young shoots are in great esteem as food among the Laplanders, and they eat the stalks roasted in hot ashes as a cure for coughs, hoarseness, and other disorders of the chest. In Norway a kind of bread is sometimes made of the roots. In this country the stalks blanched were formerly eaten as celery. In 1840, 440 cwt. were imported into England for home consumption.

Angiopteris.—A genus of plants. See DANÆEÆ.

Anguilla. *The Eel.*—See MURÆNIDÆ.

Anguillula. (*A little Eel*).—A genus of minute animals formerly placed among the infusoria under the name of *Vibrio*, but by recent zoologists arranged amongst the nematoid worms of the class *Entozoa*. Amongst the known species of this genus (which has been called *Rhabditis* by Dujardin) are the little creatures known as the eels of vinegar, porter eels, &c. The first mentioned, *A. aceti*, is not so commonly met with now as it used to be, from the change in the manufacture of vinegar. Some of the species are remarkable for their tenacity of life. *A. fluviatilis* (found in wet moss and moist earth, whence it gets washed into rivers and ditches, and thus sometimes into the intestinal canal of snails, frogs, fishes, worms, and insects), though dried up till it becomes hard and brittle, will recover, swell up, take food, and resume its reproductive powers, soon after it is moistened with water. *A. tritici*, found in blighted wheat, has been known to revive in the same way after having been kept dry for five years.

Anguis. *Blind-worm.*—A genus of reptiles belonging to the family *Scincidæ*. The species belonging to it are innocent and harmless, but are held by the vulgar in great horror. Their eyes are very small, and in consequence they have often been supposed to be blind. The body is very brittle; the tail is easily broken off, but readily sprouts out afresh, and at the end of a year is quite renewed. The common blind-worm, *A. fragilis*, is the best known species, as it is common in this country, living in holes in rocks, under stones, &c., and feeding on live worms, small shells, and insects. It will not touch them when it finds them dead. It is singularly brittle from its suddenly contracting its muscles when alarmed. The blind-worms remain torpid during winter, and cast their skin at the beginning of summer.

Anhydrite (*ἀνύδρος*, without water).—A name applied to those rocks which have as their base sulphate of lime. They are formed of lime and sulphuric acid, and consequently have no water in their composition.

Anidæi (*α*, priv.; *ἰδία*, form).—A family of monsters characterized by a total want of specific form or shape. It is, in fact, an ovoid or globular sac, enclosing no viscera, not even intestine, but consisting solely of cellular tissue, fat, some vascular branches, and occasionally a few ill-formed bones. Such monstrosities have occurred in the cow and human species.

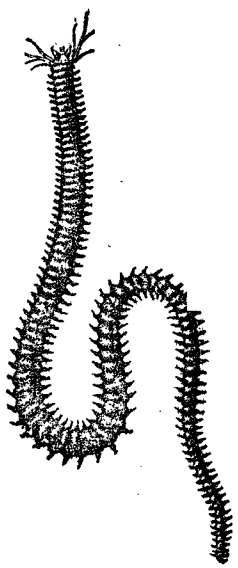
Animal.—A term employed to designate beings which live, move, and feel. It is very difficult to define properly what an animal is, as the ordinary characters of animal life seem to be possessed by vegetables also, and thus it becomes almost impossible to say when animal life ceases and vegetable life begins. It is very easy for any person to tell the difference between a *lion* and an *oak*, and to refer them to their proper kingdoms in nature; but when we descend to the minute forms of each kingdom, it becomes exceedingly difficult to assert which is an animal and which is a plant. Many minute forms which have occupied the attention of microscopic observers, and which for a length of time have passed undisputed for animals, are now proved to be vegetables; and many there are still which the zoologist and botanist must for the time being, consent as it were to a joint occupancy. In general terms, however, an animal may be defined as a being which is capable of nourishing itself and of reproducing its species, which has sensation and is endowed with the power of voluntary motion.

Animal Kingdom.—There are three grand divisions of natural objects called kingdoms of nature, the mineral, vegetable, and animal kingdoms. The animal kingdom embraces all living creatures defined to be animals, and it is the province of the zoologist to arrange these into classes, orders, families, and genera, according to their natural affinities.

Ankistrodesmieæ.—A tribe of plants belonging to the algæ. See DESMIDIACEÆ.

Annelida = Annulata (*Annulus*, a little ring).—A class of invertebrate animals often called red-blooded worms. They are elongated worms, with the body divided into numerous rings, which in the majority are furnished with bristles or hairs: their feet are never jointed, and are frequently replaced by tubercles furnished with bundles of retractile setæ. Their antennæ (when they possess them) are seldom jointed. They are endowed with a highly developed nervous system, and their vascular system is complete and closed. They all possess coloured blood. In most it is red, but in a few it is yellow or green. They respire by external branchiæ, by internal vesicles, or by the skin itself. The skin in many secretes a quantity of mucus, by

means of which the animals glue together pieces of shell, grains of sand, &c., so as to form a tube for lodging themselves in. Others secrete calcareous tubes, and others again tubes of a leathery substance. The annelides reproduce partly by a transverse fissuration, and partly by a sexual apparatus. Those species which undergo the process of division, never possess genital organs at the time it is taking place, but after this process ceases, genital organs are developed and reproduction takes place by eggs. This class is numerous in species, and has been divided into four orders. I. *Dorsibranchiata*; those species in which the respiratory organs are attached to the dorsal surface of the body along the whole or the greater portion of its length. II. *Tubicolæ*; those in which the respiratory organs are in the form of plumes, and are attached to the head or anterior portion of the body. III. *Terricolæ*; in which the respiratory organs are internal vesicles, opening externally by very minute pores. They live for the most part in the earth or mud. IV. *Suctoriæ*; with respiratory organs as in the Terricolæ. They are provided with suctorial discs by which they progress. —I. The *Dorsibranchiata* are also called *Errantes*, or wandering, because they are active in their habits, crawling and swimming with facility. To this order belong the sea centipedes or *Nereidæ*. A great number of species of *Nereis*



Nereis.

inhabit our coasts. One, *N. prolifera*, is remarkable for its mode of propagation. This consists merely of spontaneous division, the hind part of the body being gradually transformed into an additional animal. Some of the tropical species are very long and swim readily along the surface of the ocean. They are vividly phosphorescent at night. The sea mice or *Aphroditæ*, belong also to this wandering group. Their body is broad and flat, and they are furnished with two longitudinal rows of wide membranous scales, covering the back and concealing their branchiæ. The common sea mouse, *Aphrodita* (*Halithea*) *aculeata*, is abundant on some of our shores, and is a very beautiful animal, possessing splendid iridescent colours reflected from its spines and bristly hairs. It is from six to eight inches long, and two or three wide. Cuvier describes it as not yielding in beauty either to the plumage of the humming birds, or the most brilliant precious stones. This fine iridescence is produced by a number of longitudinal striæ between the component fibres of which the bristles and hairs consist.—II. The *Tubicolæ* are so called from their all (with few exceptions) living in tubes. They are also called sedentary from this circumstance. Some of the species inhabit a calcareous tube, which is generally attached to a rock, stone, or shell, &c. This tube is secreted by a collar surrounding the first segment of the body, and the animal moves freely within it, not having any muscular attachment to its surface. These belong to the family *Serpulidæ*—a family containing species which used formerly (till the animal forming the tube was known) to be reckoned amongst mollusca. It is difficult indeed to distinguish the shelly tubes of these animals from the tubular shells of some of the genera truly molluscous; but this may be always done by a careful inspection of the internal surface, showing whether the animal has been attached to it or

Serpula.

not. The mouth of the shelly tube is closed by an operculum borne on the end of an appendage with which the animal is provided on the side of its head. The operculum of one of the species has been indeed described as a genus of shells. Others inhabit tubes composed of fragments of shells, grains of sand, or small masses of mud, which are glued together by the mucus secreted by a series of glands situated at the anterior extremity of the animal's body. The shell of the *Amphitrite* or *Pectinaria* is conical, and consists of very fine sand, and the animal is remarkable for having golden coloured spines disposed in a comb-like series or in a crown, in one or several rows, upon the fore part of the head, whilst around the mouth are numerous tentacles, and on either side of the commencement of the back are pectinated gills. The tube of the *Sabellidæ* is composed of granules of clay or mud, and that of the *Terebellidæ* of fragments of shells and sand. These animals are frequently to be met with on our coasts as well as in other parts of the world. —III. The *Terricolæ* have cylindrical elongate bodies, but have neither eyes, mandibles, bristles, cirrhi, nor tuberculous feet. The common earth worm, *Lumbricus terrestris*, may be considered the type of this order. The earth worms are chiefly to be seen at night, and in the early morning, and are always found living in the earth, piercing the ground in all directions. They subsist on roots, woody fibres, animal matter, &c., and from their perforating the soil, and loosening the earth to a considerable depth, are exceedingly useful to the farmer. They possess the power of reproducing portions of their body after mutilation. They often grow to the length of a foot. They are hermaphrodite, and are very prolific. Their numbers are kept down by their becoming the prey of many birds and fishes; the hedge-hog and mole eat them in great quantities, and the frog and fresh water leeches, and the larvæ of the fresh water beetles feed upon them whenever they fall in the way.—IV. The *Suctoriæ* are, like the *Terricolæ*, destitute of bristles, cirrhi, and feet; but they have eyes and are furnished with mandibles. The skin is composed of numerous rings, and they are easily distinguished by their having a sucking disc at one or both extremities. By alternately fastening themselves to objects, and then letting go their hold, they move along with considerable rapidity. The leech family, *Hirudinidæ*, are the most remarkable animals belonging to this order. They are furnished with a sucking disc at each extremity. Some of these are inhabitants of the ocean, and are found parasitic upon fishes and other aquatic animals. Such are the *Pontobdella = Albione*, which infest the bodies of the skate, and are commonly called by the fishermen skate suckers. The *Trochetia* is a large leech, an inhabitant of our fresh waters, but coming frequently on land to pursue the common earth worm. The common horse leech, *Hæmopis Sanguisuga*, is a common inhabitant of our ponds and ditches, and is reported to inflict wounds when it bites, which are difficult to heal. The species, however, which is of the greatest value, is the medicinal leech, *Sanguisuga medicinalis*. The mouth is situated in the centre of the anterior sucker, and contains three jaws. Each of these is armed on its edge with two rows of very fine teeth, which penetrate the skin by a motion resembling that of a semi-circular saw. As a remedial agent in medicine, leeches are held in deservedly high repute. They are inhabitants of the fresh waters of this country, but our chief supply is from abroad, from the south of France, Sweden and Norway, Poland and Hungary, &c. A species, apparently identical, is also found in India and China. Immense numbers are annually imported into England; and it is stated that, a few years ago, four only of the principal dealers in London imported annually between seven and eight millions! The *Phillinidæ*, which are found parasitic upon fresh water fishes, &c., are distinguished by having a sucker only at the posterior extremity.

Annularia.—A fossil plant belonging to the coal formation or carboniferous system. The

Annularia.

affinities of this plant are as yet unknown, but it is considered by some authors to resemble the *Marsiliaceæ*.

Annulata.—Red blooded worms. See ANNELIDA.

Annulosa.—A division of the animal kingdon. See ARTICULATA.

Anobium.—A genus of coleopterous insects inhabiting the wood of houses, furniture, &c. The larvæ of these animals do much injury to books, tables, &c., by piercing them with little round holes. One species, *A. tesselatum*, popularly termed the death-watch or tick, is remarkable for the superstitious feeling connected with it. In spring or summer, this little creature, which is about a quarter of an inch long, may be heard distinctly at some distance off making a noise exactly like that of a person tapping moderately hard with the finger nail on a table. A

succession of these, to the number, generally, of from seven to eleven, takes place pretty rapidly, and they are repeated at irregular intervals. This is in reality the call or signal by which the male and female are led to each other, but which from ignorance and superstition has been constituted into a mysterious sign that some one in the house will die within the year. The sound is indeed very difficult to trace, and the beetle itself being of the colour of decayed wood, eludes the search. The writer has heard it on board ship, tried ineffectually to detect the spot whence the sound proceeded, as it seemed to follow him from one part of the cabin to another, and had to combat at the same time the superstitious forebodings of an invalid that it foretold his decease.

Anolis or **Anolius.**—A genus of reptiles belonging to the family *Iguanidæ*. There are a good many species of this genus all natives of America. They appear to take the place in the New World of the chameleons of the Old. They are slender and graceful, very active and restless, and perfectly harmless, living upon flies and other small insects, and sometimes also on fruits and berries. Like the chameleons, they possess the power of changing the colour of their skin with great rapidity. When they are actuated by strong emotions, as anger, love, or fear, they distend the loose skin of their throat and then assume an endless succession of ever-varying hues. They climb and leap with such agility that their motions have been compared to the flight of a bird, and when fatigued they will stop, open their mouths, and pant like a tired dog.

Anomia (*ανομοιος*, unequal).—A genus of bivalve shells allied to the oyster. The shell is generally translucent and pearly within. It is attached to rocks, sea-weeds, &c., by a plug generally pretty strongly calcified, which passes through a hole or notch in the right valve. This plug is secreted by a peculiar muscle, which passes through the notch in the upper valve, attaches itself to the rock or stone upon which the shell is afterwards fixed, and there forms the shelly plug. A considerable number of species (about twenty) are described, distributed over Europe, Asia, and America. They frequently acquire the form of the surfaces upon which they are attached, and in this way the same species presents a great many varieties of shape.

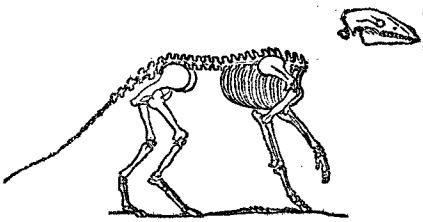
Anomma.—A genus of ants containing the driver ants. See FORMICIDÆ.

Anomoura (*ανομοιος*, dissimilar; *ουρα*, a tail), *Irregular-tailed Crustacea.*—A section of the class *Crustacea*. See DECAPODA. The animals belonging to this section have the abdomen or tail in general slender, in some folded up under the body, in others extended; sometimes entirely membranous, at others more or less covered with the crust or shell. It is not formed to assist in swimming. The penultimate segment has in some a pair of appendages more or less developed; in others these organs are wanting. The carapace of the upper part of the body is better developed than that of the abdomen, and in many cases resembles that of the *Brachyura*, though in others it is elongated. The antennæ are generally large and are not capable of being bent back, nor are they lodged in cavities as they are in the short tails. The nervous system consists of several gangliar masses, and the branchiæ or gills are numerous. The species belonging to the *Anomoura* are varied in form and constitute several families. The sponge crabs, *Dromia*, when young, have a tail formed like that of the lobster, which is evidently then a swimming organ. This they lose when adult, and then the animals become slow walkers, and many of them have the peculiar habit of enveloping themselves in sponge. The crab lobsters, *Porcellana*, have a short tail, and they possess the power, if seized by the claws, of throwing them off instantly to facilitate their escape. The hermit crabs, PAGURUS, which see, have a lengthened abdomen, and are very curious in their form and habits.

Anonaceæ. *The Custard Apple Family.*—A family of polypetalous dicotyledonous plants, consisting chiefly of shrubs or trees, and inhabiting tropical countries. The species abound in aromatic and fragrant qualities. The fruit of several of the species of *Anona* is much esteemed by the natives and well known as the custard apple of the West Indies. The flowers of some of the species are highly fragrant, the leaves of others give a grateful perfume, and the dried fruits of many are delightfully aromatic. Such is the fruit of the *Xylopia* (*Uvaria*) *aromatica* or Ethiopian pepper, which is used as pepper in Africa. The wood of one species *Anona palustris*, is so soft that it is used instead of corks to stopper bottles with, and in Jamaica is hence called cork wood. The lancewood so much used by coach-makers, is obtained from another species, *Duguetia quitarensis*. The cherimoyer is the fruit of *Anona Cherimolia*, a native of Peru, and is as much esteemed in the western parts of South America as the custard apple, to which it bears a great resemblance, is in the West Indies.

Anoplotherium (*α*, priv., *οπλον*, a weapon; and *θηρ*, a wild beast).—A fossil genus of extinct pachydermatous quadrupeds, discovered in the gypsum quarries of Paris and the fresh water deposits in the Isle of Wight. They had no tusks or organs of offence, and their teeth were formed for masticating vegetable food. The structure of their feet approximates them with the ruminating animals. Several species are described by Cuvier, and as restored by him, must have been extraordinary looking animals. *A. commune* must have been the size of an ass, but with very short thick legs, short ears, and an enormous tail. In appearance and habits of life it must have resembled the otter, living in or close to the water, and possessing a smooth skin like that animal; but it was herbivorous in its food, living on marshy suc-

culent plants. *A. gracile*, on the other hand, must have lived on the dry land. It had a short tail and long ears. It was most probably very rapid in its movements, running swiftly



Anoplotherium commune.

and light as the gazelle, and subsisting upon dry aromatic herbs or shoots of trees. Other species were much smaller, about the size of our hare and guinea pig, and seem to approximate somewhat to the musk deer of the present time.

Anoplura.—An order of insects destitute of wings, and living parasitic upon other animals. They undergo no regular metamorphosis as most other insects do, but in their course to maturity they shed their skin a certain number of times, which most probably enables them to acquire greater symmetry of form, and a greater perfection of organs. To this order belongs the family of lice, *Pediculidæ*, which are so disgusting to our notions of cleanliness and propriety. Almost all animals, man, quadrupeds, birds, and reptiles are liable to be infested with these parasites, and were it not for our *feelings* with regard to them, the study of their various forms and habits are sufficiently interesting. Upwards of 500 species have been described, and as they are so universally diffused, they no doubt serve an important purpose in creation. Their superabundance, however, upon the persons of the human race, are either the causes of, or are intimately connected with grave diseases; and many cases have been related of persons having died from this cause.

Anoura (*a*, priv.; *οὐρα*, a tail).—A sub-order of batrachians. See BATRACHIA.

Anous. *The Noddy.*—A genus of birds. See LARIDÆ.

Anseres.—An order of birds, sometimes also called *Palmipedes* and *Natatores*, web-footed or aquatic birds. The toes of these birds are united together by a web, their plumage is close, shining, and oily, and they live chiefly on fish, mollusca, and insects. They build their nests either on the ground or among the reeds in the neighbourhood of water, and they pass most of their time on the water, where they find their food. This order contains the geese, swans, ducks, &c., which are now divided into as many families and sub-families.

Anserinæ.—A sub-family of the extensive family *Anatidæ*, containing the geese properly so called. The species of this sub-family are numerous, and they are found in various parts of the world during their periodical flights. Their food consists of grain and grass, and during summer they inhabit marshy districts. The origin of our common domestic goose is the *Anser ferus*, the wild or grey-lag-goose, which is perhaps the largest species of the family, measuring five feet in extent of wings. The wild goose is found all over the world, from Lapland to the Cape of Good Hope, Arabia, Persia, China, and Japan; and in America, from Hudson's Bay to South Carolina. In China, it is rather remarkable, the wild goose resembles our domesticated goose, while the tame goose resembles our wild goose. They breed in immense numbers in the lakes, swamps, and dreary marshes of Siberia, Lapland, Iceland, and the northern shores of America. In their migrations they fly in flocks of 50 or 100, rising to a great height, and preserving much regularity. Sometimes they form a straight line, and at others a wedge or the shape of the letter V. They are very vigilant, and are difficult to be taken. Their place in this country, where at one time they used to breed, has been taken by the tame or domesticated goose. This bird is of great value, both as an article of food and as furnishing very fine down and feathers. The quills, which some years ago were in constant use for writing with, are now in a great measure replaced by steel pens, but still the preparation of goose quills is carried on to a considerable extent. Immense numbers of this bird are reared in England, and the annual consumption of them in London alone, is enormous. The snow goose, *Chen hyperboreus*, is an abundant species of the northern parts of the world, and is very useful to the natives of Siberia as an article of subsistence, each family it is said preserving thousands annually. The common goose of the United States of America is the Canada goose, *Anser* (*Cygnopsis*) *Canadensis*, which is used as an article of food by the natives to a great extent. The people at Hudson's Bay greatly depend upon these birds, and in favourable seasons, during their annual migration, kill some thousands, which they pack up for future use. Fossil remains of some species of *Anseres* have been examined in Yorkshire and elsewhere.

Antennæ (*ante*, before).—The moveable-jointed, horn-like members placed on the head of insects and crustacea, but not connected with the mouth. They are tubular or perforated throughout their whole length, the internal cavity containing a soft or membranous substance, and receiving the last branches of the nerves and tracheæ of the anterior extremity of the body. They differ in size and form in the different sexes. The use of these organs has been a subject of much discussion, and is still involved in doubt. Some naturalists affirm that they are

the organ of smell, and maintain this opinion because they are longer and generally more developed in males than females. Others assert that they are the organs of touch, while others still, and perhaps with justice, believe that the primary function is that of hearing, or feeling the vibrations of the atmosphere. The number of joints, the difference in their form, &c., are good characters for distinguishing the genera and species of insects.

Antennaria.—A genus of *Fungi*; long hair-like products often seen in damp, close places. *A. cellaris* is frequently observed in cellars growing on bottles, casks, &c., and commonly hanging down a foot or more in length from the roof.

Anthemis. *The Chamomile.*—See CORYMBIFERÆ.

Anther.—The essential part of the male or fertilizing organ of flowering plants. It contains the pollen-cells which are considered necessary for impregnating the female. The anther is generally supported on a stalk or filament, and with it constitutes the *Stamen*.

Antheridia.—The general name applied to all the various structures in which the fertilizing function of reproduction resides in flowerless or cryptogamic plants, and which consequently correspond physiologically with the *anthers* of the flowering plants. In the cells of which they are composed there are extremely minute bodies which are endowed with spontaneous motion when placed in water. This motion is owing to the presence of cilia upon them. These moving bodies are known by the name of *Spermatozoa*.

Anthidium.—A genus of hymenopterous insects belonging to the family *Apidæ*. The species are called "carding bees," and are natives of the south of Europe and north of Africa. One species occurs in England. The female detaches with her mandibles the cottony down on certain plants, such as the *Stachys germanica*, &c. This she forms into small pellets, which she carries with her feet into holes in walls or trees, which she selects for the cradle of her family. When a sufficient quantity of this cottony down has been collected, she deposits it in the nest along with her eggs, which she covers with the same downy substance. The young there undergo their transformations, but do not become perfect insects till the following year.

Anthochæra. *Wattle Bird.*—A genus of birds belonging to the family *Meliphagidæ* or honey eaters; natives of Australia. They are bold and spirited birds, driving away all others from the part of the tree on which they are feeding. The male has a peculiar harsh note like a person vomiting; hence its local name *Goo-gwarruck*, by which the natives have attempted to imitate it. They feed on honey and insects which they extract from the blossoms of the trees called *Banksias*. These trees are in blossom most of the year, and it is where these trees abound that the bush wattle birds are found also. As Banksias are observed to be a sign of the land not being good, the presence of this bird may warn the settler of the nature of the soil.

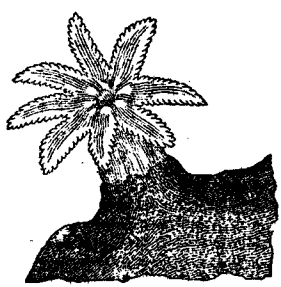
Anthonomus.—A genus of beetles. See CURCULIONIDÆ.

Anthophora (*ἄνθος*, flower; *φορεω*, to carry).—A genus of bees. See APIDÆ.

Anthozoa (*ἄνθος*, a flower; *ζωον*, an animal.)—A class of animals generally arranged amongst the zoophytes, and embracing those species which are referable to the radiated type of the animal kingdom. From late observations, however, the animals of the *Anthozoa* appear to be closely related to the *Medusæ*, forming, indeed, a sub-order of the pulmogrades or *Discophoræ*. They are thus characterized:—Body tending to globular, contractile in every part, symmetrical; mouth and vent one; gemmiparous and oviparous; mouth surrounded with a circle of retractile non-ciliated tentacles. The anthozoa are divided into three orders, which contain numerous interesting species. Order I.—The hydroid polyps, *A. Hydroida*, have the polypidom horny, fistular, external, plant-like. The polyps are generally compound, and have the body for the most part of a somewhat globular figure, and of a nearly homogeneous composition, consisting of an aggregation of vesicular granules held together by a semi-transparent glairy gelatine. They are very contractile, and can change their form at pleasure. The tentaculæ surrounding the mouth are generally numerous, and are always simple and filiform or tapering a little towards the extremity, and have their surface roughened more or less with granules arranged in an imperfectly verticillate fashion. These granules are possessed of a peculiar apparatus adapted for paralyzing and killing the animalcules the polype feeds upon. They are similar in form and function to what in the *Acalephæ* are called the nettling organs. See an account of these organs under ACALEPHÆ. In the centre of these tentacula is placed the mouth, which is very dilatable, and leads by a short passage into the stomach. They have no nervous system, no organ of sense in the adult; no organ exclusively appropriated to the function of respiration; no circulating system nor any vessels for carrying the digested products of the stomach into and throughout the body. All seem to be confused and combined; and the water in which the polypes live, in its flow over the external surfaces, and in its penetration into the stomachal cavity, suffices to impart the oxygen necessary to complete the assimilation of the nutritive liquid that oozes from its source directly into the parenchyma of the body with which it enters into combination. The anthozoa are propagated by buds or gemmules, and by eggs; the former extending their individual life, and the latter multiplying and continuing the species.

The bud is a shoot from the body, and is identical in structure with the part of the parent whence it pullulates, *Hydra*. The eggs are of several kinds. One sort produces young, which, when first born, are very unlike their parents, and resemble minute medusæ. They are free and unattached, swimming at large in the water, and possess a higher organization than the adult animal, *Tubularia*. They have senses to guide, and muscles to move the body to and fro, and it is not until they have undergone a series of changes or metamorphoses, that they become staid, their muscles and nerves disappear, and they fall down into an inferior order. Another sort produces young which undergo no change in their development, amounting to a metamorphosis. As soon as they are extruded from the ovisac they settle, root, and glide insensibly into the resemblance of the parent species. A third set are in the form of ciliated animalcules, which have freedom of motion, and swim in the water as if guided by volition and sense, whirling on their axis, and stopping occasionally as if in search of a situation on which to fix themselves. Some of these are like *planariæ*, as in *Sertularia*, others like *infusoria*, as in *Campanularia*. After a short life of this sort they obtain a proper site for their permanent stay and future growth, and begin to shoot up into those beautiful forms peculiar to the species. See ALTERNATION OF GENERATIONS. Many, if not all of the marine hydroid polypes, are luminous in the dark. In the *Corynidæ*, the polypes are naked, or with only a rudimentary polypidom, and their upper part is dilated into a clavated head, armed with tentacula, which have frequently globose tops. There are many species, all marine except one, and growing parasitic upon seaweeds, shells, rocks, &c., &c. In the *Tubulariidæ*, there is a distinct polypidom, which is plant-like and horny, consisting of simple and slightly branched tubes with the naked polypes protruding from the ends, and armed with one or two circles of smooth filiform tentacles. The species are marine, and parasitic on shells, sea-weeds, &c., &c. In the *Sertulariidæ* the polypidom is plant-like, horny, variously branched and tubular. A number of lateral buds are thrown out, which form for themselves small teeth-like cases in the sides of the stem, and as in each species the buds are thrown out in a regular and definite manner, the united mass of animals resulting from this union assumes a defined form, which is peculiar to each species. They are generally remarkable for their beauty of form and graceful appearance, and are all found parasitic on sea-weeds, shells, stones, &c. In the *Campanulariidæ* the polypidom is plant-like and horny, and the polype cells are thin and campanulate, terminal and elevated on a ringed foot-stalk, disposed either alternately or irregular. The polypes are furnished with a single series of filiform tentacula. They are all marine, growing parasitically upon sea-weeds, shells, &c., are very elegant creatures, and the minuter species form beautiful objects for the microscope. The *Hydra*, or fresh water polype, belongs also to this division, according to most naturalists. In the hydra, the polypes are locomotive, single, naked, gelatinous, sub-cylindrical, but very contractile and mutable in form, the mouth encircled with a single series of granulous filiform tentacula. The hydræ are all natives of fresh water only. Though usually found attached, they can nevertheless move from place to place, either by gliding with imperceptible slowness on the base, or by stretching out the body and tentacula to the utmost, fixing the latter and then contracting the body towards the point of fixture, loosening at the same time its hold with the base. Their usual motion is very slow, but when seizing their prey, they are nimble and active. They are exceedingly voracious, and their long tentacula are spread out in all directions to entrap their victims. Worms and other annelides are killed almost immediately they are seized, though entomostraca, which are provided with a shell, frequently escape from their grasp unharmed. This has lately been explained by the investigations into the *nettling* organs, which are found on those tentacula. See ACALEPHÆ. The usual method of reproduction in the hydra in summer is by gemmation. On various parts of the body (the tentacula excepted), we see a small tubercle rise on the surface. Lengthening and enlarging hourly, in a few days a perfectly formed hydra is evolved. In a short time after it is thus formed it is thrown off from the parent stem, but frequently before that takes place a similar young polype has begun to be developed from it also, and this may be repeated till even a fourth generation may be pushed out before the first fall off. In autumn, however, the hydra produces ova, which are extruded from the body, and in the following spring are developed into perfect polypes. A third method of propagation takes place in hydra, viz., by fissuration. If the body is halved in any direction, each moiety becomes a perfect hydra; or even if it is cut into four, or eight, or many pieces, each morsel becomes a separate perfect animal! Order II.—The asteroid polypes, *Anthozoa Asteroida*, have the polypidom variable in form, either free or attached, of a fleshy consistence, strengthened with a horny or calcareous axis, enveloped in a gelatinous crust in which the polypes are immersed. These are compound, living in societies closely united in a single mass by their outer skin; and the mouth is surrounded with only eight fringed tentacula. The stomach ends in six or eight elongated processes, which are considered as the oviducts. The polype mass is propagated by gemmation; and as each species emits its buds in a peculiar form, the shape and size of the mass depends upon the manner or pre-ordained fashion in which the buds are

evolved. The species, again, are propagated or increased by eggs. These are expelled from the ovisacs into the stomach, and from thence ejected into the sea. They are ciliated, and possess motion as if apparently actuated by volition. Some of the species of this order are phosphorescent. The sea pens, *Pennatulidæ*, have the polype mass free, of a fleshy substance, and in form of a pen. The species of *Pennatula* have the shaft sub-cylindrical, and the part corresponding to the plume twice pinnate. They are very common on our coasts, and they are beautifully phosphorescent in the dark. The species of *Veretillum* have the polype mass stalk-like, and perforated longitudinally with four straight canals, which open externally at its lower extremity. *V. Cynomorium*, a Mediterranean species, has the lower end of its stalk plunged in the sand at the bottom of the sea, and is phosphorescent at night. The *Virgularia* has the polype mass linear elongate like a rod or like a quill stripped of its feathers; and the *Pavonaria* has this rod-like polype mass quadrangular. In the gorgoniæ, *Gorgoniidæ*, the polype mass is attached by a root, and is formed like a shrub; consisting of a horny, flexible, central position or axis, covered externally with a polypiferous crust, like the bark of a tree. In some of these, this axis is quite black, and these species have been called the black coral, *Antipathes*. They were formerly much esteemed for their supposed magical and medicinal qualities, but are now only used to make riding whips and whisks. Some of the *Gorgoniæ* are very handsome, and much branched and reticulated. These are called Venus's fans. The *Primnoæ* are natives of the north seas; and on the coast of Norway specimens have been mentioned by travellers growing in deep water, and exceeding the height of lofty trees. The organ corals, *Tubiporidæ*, have at first a tough skin, which becomes at length so hardened by the deposition of calcareous matter within its substance as to become a hard coral. The animals live in groups side



One of the Polypes magnified.

by side, and the shelly tubes formed by them give the appearance of the pipes of an organ—hence the name. These tubes are of a vivid red, and the animals being bright green, the mass forms a beautiful object when alive. In the calcareous corals, *Coralliidæ*, a larger quantity

Corallium rubrum.—Red Coral of commerce.

of calcareous matter is deposited along with the horny matter, forming a stone-like axis, as in the red coral of commerce. This coral, so much admired for its fine red colour, and the high polish of which it is susceptible, adapting it for making beads and other trinkets, &c., forms a very profitable trade in the Mediterranean, where it is chiefly found. It is procured by dredging and diving, and its fishery gives employment to numbers of people. In the glass-rope corals of Japan, *Hyalonemidæ*, the axis is composed of a bundle of thin transparent fibres, looking exactly like a rope of spun glass. These fibres are formed of nearly pure flint, and are hard enough to scratch glass. The end of the axis is lodged in a species of sponge. In the alcyonians, or sea fingers, *Alcyonidæ*, the polype mass is fixed, coriaceous, or somewhat fleshy, strengthened by calcareous spicula; the polype cells subcutaneous, and scattered over the surface. There are two genera, *Alcyonium* and *Sarcodictyon*, both encrusting other substances, the one often rising in conical masses, and variously lobed; the other linear, creeping and anastomozing. The common species of *Alcyonium* are very abundant on our coasts, and are well known by the name of cow's paps, dead men's fingers, &c. The outer skin is studded all over with star-shaped figures, which, if examined attentively, may be seen to be divided into eight rays, indicating the number of the tentacula of the

polype which issue from them. When the alcyonium is placed in sea-water the polypes protrude very much, and extend their tentacula, which are short, thick, obtuse, and grooved along the centre. A few species of this order are found fossil in the magnesian and carboniferous limestone, and in the lower chalk. Order III. —The zoanthoid polypes, *Anthozoa Helianthoidea*, have the polypes single, free, or permanently fixed; fleshy, either naked or encrusted with a calcareous polypidom, the upper surface crossed with radiating lamellæ. The mouth of these polypes is encircled with tubulous tentacula, which being disposed in regular circles and tinged with a variety of colours, represent not unaptly the petals of some flowers. Their stomach is membranous, and furnished with more or less numerous longitudinal folds. They have no intestine, and no visible exit from the stomach, except the mouth, by which the undigested remains of the food are ejected, always enveloped in a large quantity of a clear glairy fluid. They are oviparous, the ovaries being internal. Amongst those species which have the polypes naked, are the actinias or sea anemonies, ACTINIDÆ. See this word. The external envelope of these is a thick, firm, fleshy, or coriaceous skin, consisting of a corium and epidermis, the former layer constituting the chief organ of support, and giving the animal its peculiar form. By far the greater number, however, of the zoanthoid polypes, as they grow, deposit in the cellular substance of the flesh of their back, an immense quantity of calcareous matter, which enlarges as the animal increases in size, and in fact fills up all those portions of the substance of the animal which by the growth of new parts are no longer wanted for its nourishment, and in this manner they form a hard and strong case, amongst the folds of which they can contract themselves, so as to be protected from external injury, and by the same means form for themselves a permanent attachment, which prevents their being tossed about by every wave of the element in which they live. The stony substances so formed are called *corals*, and their mode of formation causes them exactly to represent the animal which secretes them; the upper surface is always furnished with radiating plates, the remains of the calcareous particles which are deposited in the longitudinal folds of the stomach. "Every one has read of the coral islands of the tropical seas; how they grow from the fathomless profound, and how they rise to-day by the operations of puny insects, which in countless numbers and in untold generations, effectuate changes on our globe superior, perhaps, to what all other animals united do, and compared to which the greatest achievements of intellectual man sink into insignificance." These little creatures construct islands and continents for the habitation of man. "The labours of a worm, which man can scarcely see, form mountains like the Apennines, and regions to which Britain is as nothing." In former days the geologist tells us they were numerous and varied in our seas. With these worms the great work of creation began, as witnessed in the extensive ranges of limestone rocks which lie buried in our northern regions. By means of them, immense tracts of what is becoming dry land, are forming daily in tropical seas—

"The sea snatched isle is the home of men,
And mountains exult where the wave hath been."

The formation of these coral islands is slow, and the polypes for the greater part do not build them from a greater depth than from 20 fathoms to 20 or 30 feet. They never build above low water mark, and thus these coral islands never rise many feet above the surface of the ocean. The elevation of the land is principally owing to the action of the sea. Large masses are detached by the waves and washed upon the reef: shells, coral, sand, and other debris are likewise washed up on to it, and accumulate till a surface is formed with a layer of soil upon it capable of supporting various forms of vegetable life. It is soon visited by birds; sea plants take root; and from the rapid and luxuriant vegetation of the tropical climate, fresh layers of mould are deposited; a cocoa nut or a pandanus drupe is thrown ashore; land birds then visit it and deposit the seeds of shrubs and trees; every high tide, and still more every high gale adds something to the bank; the form of land is gradually assumed; and last of all comes man to take possession. There are numerous genera and species of corals, the variations in form depending upon the manner in which the animal emits from the whole surface, or from a particular part of the sides of its body, the bud by which the new individuals of the general mass or society are produced. When the animals are simple and solitary, and only a single star is visible, they form the genus *Fungia*. When the coral is branched and the animals are many, but confined to the extremities of each branch, the genus takes the name of *Caryophyllia*. In some, the whole surface of the coral is roughened with little stars, showing the numbers of animals living in society. Those are the *Madrepores*. In the brain coral, *Meandrina*, the surface is formed into little hills and valleys, or ridges, like the convolutions of the brain. In each hollow there are mouths where the animals are visible, but the tentacula, instead of forming stars or rosettes around them, are ranged along the sides of the hollows. In some species the stars are only on one side, and the coral grows broad and expanded. These constitute the genus *Explanaria*.

Anthracite (ἄνθραξ, charcoal). — A black mineral substance of light weight, and constituting a variety of coal. It burns without flame and with little smoke, hence it is used in manufactories, where the object is to get rid of the nuisance of smoke. It is also used now in the hot blast process

for iron. It is closely allied in composition to the graphite or *black lead* of commerce, carbon entering largely into its composition. It is also called blind coal or glance coal, is of vegetable origin, and occurs abundantly in Wales in the coal measures.

Anthracotherium (*ἀνθραξ*, coal; *θηριον*, beast).—A genus of fossil mammalia, belonging to the order *Pachydermata*, and related to *Anoplotherium* and *Chœropotamus*. Five species have been described. They are found in the lignites and coals of Cadibara.

Anthrenidæ.—A family of insects belonging to the order *Coleoptera*. The perfect insects or beetles, are small, and live in general on plants, sucking the nectar of the flowers. The larvæ are well known for their ravages amongst specimens of dried animals, preserved in museums. That of *Anthrenus museorum* is furnished with two strong mandibles, by means of which they quickly destroy everything they attack, and are the great pests of our museums.

Anthrenus.—A genus of beetles. See ANTHRENIDÆ.

Anthropoides (*ἀνθρωπος*, a lover of men).—A synonym of the genus *Scops*. See ARDEIDÆ.

Anthropolite (*ἀνθρωπος*, man; *λιθος*, stone).—A name given to fossil human remains. Almost all the instances which have been brought forward to show the existence of human bones being fossilized, have been demonstrated by recent researches to have been incorrect. Bones of man, however, have been found in some of the bone caverns in Belgium, associated with those of extinct species of bears, rodents, &c., but the occurrence of those may be easily explained without giving them credit for any great antiquity. The only cases of human skeletons being found embedded in the solid rock, is that of the island of Guadaloupe, but in this case it can be proved satisfactorily that the limestone in which they are embedded is of very recent formation, or which may be formed in a comparatively short period.

Anthus. *The Pipit* or *Tit Larks.*—A genus of birds belonging to the dentirostral tribe of the order *Passeres*. The pipit larks resemble very much the true larks, but though they have the hind claw and the same general plumage, their other characters cause them to be transferred to the family of water wag tails. (*Motacillidæ*.) The bill is long and slender, and the birds are not granivorous. The common pipit, *Anthus pratensis*, inhabits meadows and low marshy grounds, and has a remarkably fine note, singing perched on trees, seated on the ground, or flying in the air. In this latter position it does not commence its song till it has attained a considerable height, whence, after hovering a little, it descends warbling till it reaches the ground. It is to this species that the eggs of the cuckoo are generally confided. It is common throughout Europe. The tree pipit, *Anthus arboreus*, begins his song on the top of a bush or lofty branch of a tree. Presently he rises in the manner of the sky lark, till he has arrived at about double the height from which he sprung; when, with outstretched wings and expanded tail, he makes a half circle in his slow descent, singing all the while till he arrives at the spot from which he started, or reaches the top of some neighbouring tree. The nest is usually placed on the ground. Several other species are known.

Antiaris. *The Upas Tree.*—See ARTOCARPACEÆ.

Antidorcas.—A genus of antelopes. See ANTILOPEÆ.

Antilocapra.—A genus of antelopes. See ANTILOPEÆ.

Antilope. *The Antelope.*—See ANTILOPEÆ.

Antilopes = Antilopinæ. *Antelopes.*—A division of the large family *Bovidæ* or hollow-horned ruminants. The horns of the antelopes are almost always round, and annulated or ringed. The greater portion of the species possess the lachrymal sinus or "tear pits," and in general they have inguinal pores, or sacs in the groin, opening inwards and secreting a glutinous substance. The hair is usually short and smooth, and of an equal length over every part of the body. The ears are commonly long, narrow, and pointed; and the tails are for the most part short, round, and tufted at the extremity. They are of an elegant and active make; restless and timid, watchful and remarkably fleet and agile. The swiftness of the antelope is often alluded to in the Bible. Their sense of smell is acute; and their large black eyes are remarkable for their brilliancy and sharpness of vision. The greatest compliment a lover can pay to his mistress in the East is to compare her eyes to those of the antelope; and it is said Tabitha, the disciple raised to life at Joppa, who was also named Dorcas, was called so from the colour of her eyes. The great majority of the family are inhabitants of hot climates, though Africa is the country where they most abound. They live in large herds, and the chase of them is a favourite diversion in the East. The species now described are very numerous, and may be divided into two large groups; the "antelopes of the fields," in which the nostrils are bald and free from hair; and the "antelopes of the desert," in which these organs are bearded within or covered with bristles. Amongst the antelopes of the field are, I. the true antelopes, such as the saiga or colus, *Saiga tartarica*, the only European true antelope, inhabiting the open steppes and deserts, from the Danube to the Irtish eastward, and as far north as 54° north latitude. The chiru, or *Panthalops Hodgsonii*, inhabiting the elevated plains of Thibet, and which, from often losing one of its horns, in consequence of its pugnacious propensities, has been called by the natives the unicorn, being considered by them to possess only a single horn. The dzeren, or yellow goat of the Chinese, *Pro-*

capra gutturosa, inhabiting the dry arid deserts of Central Asia, Thibet, China, and Southern Siberia; remarkably swift animals, and when frightened clearing at one leap twenty or twenty-five feet at a single bound. The gazelle, *Gazella Dorcas*, a native of Egypt, Barbary, and Asia

Gazella Dorcas, var.—The Gazelle.

Minor, living in large troops, but easily domesticated, and a favourite with poets from its elegance of form, and its large, soft, black eye. The mohr, *Gazella Mohr*, of West Africa, which is much sought after by the Arabs, on account of its producing the bezoar stones, so highly valued in Eastern medicines. The spring-boc, *Antidorcas Euchore*, of South Africa, celebrated for its fleetness and the habit of leaping upright, and wandering over the karroos and dry plains in flocks of from 10,000 to 50,000 individuals. The sasin, or common antelope of India, *Antilope cervicapra*, one of the most beautiful of all the species, and certainly the swiftest; inhabiting the vast plains of India, in families of from ten to fifty or sixty grown females to one male, and exceedingly wary and shy. The stein-boc, *Calotragus campestris*, and grys-boc, *Calotragus melanotes*, natives of Southern Africa, living in pairs in the dry open plains in the colony of the Cape of Good Hope, extremely swift and shy, and excellent eating. The klippespringer, *Oreotragus saltatrix*, inhabiting the barren and most inaccessible mountains of the Cape, reckoned good eating, and its hair much esteemed for stuffing saddles and mattresses. The madoqua, *Neotragus Saltiana*, the smallest of all horned quadrupeds, not larger than a hare, living in Abyssinia. The duyker-boc, or diver goat, *Cephalopus Grimmia*, remarkable for plunging under the bushes when pursued instead of leaping over them as other antelopes: and the little kleene-boc, *Cephalopus pygmæa*, one foot high only at the shoulder, active, and of a mild gentle disposition, both inhabiting the forests and ground covered with underwood at the Cape, and living singly, or in pairs. There are many other species belonging to this group too numerous to mention. —II. The cervine antelopes; such as the water buck, *Kobus ellipsiprymnus*, of Southern Africa, which derives its name from rushing into the water and crossing rapid rivers when pursued; and the sing-sing of Western Africa, *Kobus sing-sing*. The blauw-boc or blue buck, *Hippotragus leucophæus*, which lives in pairs or in small families on the open plains of South Africa, is very swift, and exceeding fierce when wounded or in the rutting season, one variety so much so that the natives are afraid to attack it. The gems boc, *Oryx Gazella*, inhabiting the open plains of South Africa, living in pairs or small families, bold and powerful, and so ferocious that even the lion has been worsted when he has attacked it. The oryx, *Oryx leucophæa* remarkable for its long slender horns, and being most probably the animal which gave origin to the fabulous unicorn of the ancients; living in herds in Nubia, Sennaar, and Senegal, and frequently represented in the ancient monuments of Egypt. The addax, *Addax nasomaculatus*, mentioned by Pliny, and found by modern travellers inhabiting the sandy deserts of Central Africa, and living in pairs.—III. Goat-like antelopes; such as the cambing outan or wild goat of Sumatra, *Capricornis Sumatrensis*, inhabiting the hilly forests of Sumatra. It is active and sure-footed as the goat or ibex, and partakes much of the habit of the latter, particularly resembling it in its bold undaunted bearing. The chamois, *Rupicapra Tragus*, which inhabits the loftiest chains of the primitive mountain ridges of Europe and Western Asia, such as the Pyrenees, the Alps, Mount Taurus, &c., possesses remarkable agility in ascending and descending rocks apparently perpendicular, and is the favourite object of the chase amongst the hunters of those mountainous regions. The prong-horn, *Antilocapra Americana*, of North America, inhabiting the western parts from the 53d degree of N. lat., to the plains of Mexico and California, living in herds in the open plains and hills of moderate height. The antelopes of the desert are not so numerous; some are equine in their appearance, as the gnu, *Connochetes Gnu*, the neck, body, and tail of which resemble those of a horse, their gallop also being exactly similar to that of the wild zebra. They live in extensive herds on the Karroos of South Africa; are wild and difficult of approach, and when wounded will turn on the hunter and attack him with the utmost ferocity. Others resemble oxen, with a broad nose and a moderate moist muffle—such are the bubale, bekker el wash, or wild ox of the Arabs, *Alcephalus Bubalis*. The harte beest of South Africa, *Alcephalus Caama*, living in large herds and

forming a favourite object of pursuit among the natives and colonists, who greatly prize the flesh as excellent eating. The various species of the genus *Damalis* — as the bonte-boc, *Damalis pygarga*; the bless boc, *Damalis albifrons*; the korrigum, *Damalis Senegalensis*, &c.

Antimony.—A compact brittle metal occasionally found pure in nature, though in small quantities; generally mixed with lead, silver, arsenic, and other metals. The ore which is the most important and from which it is obtained for commercial and medicinal purposes, is the sulphuret. Antimony enters into the composition of several alloys used in the Arts. *Type Metal* is composed of from $\frac{1}{4}$ to $\frac{1}{12}$ of antimony, the rest being lead, tin, bismuth, and copper. *Hard Pewter* is made of twelve parts of tin and one of antimony. *Britannia Metal* of antimony, tin, bismuth, and copper. Antimony is procured from Hungary and France. Our own country produces a considerable quantity, and of late it has been imported from Borneo. Antimony forms the chief ingredient of the celebrated James's Powder, and is much used in medicine at the present time.

Antipathes.—A species of gorgonia. See ANTHOZOA.

Antlia.—The proboscis or long spiral tongue of the insects belonging to the order *Lepidoptera*. When this organ in a butterfly is extended, it forms a long suctorial tube, and when coiled up represents a flat spiral, like the main spring of a watch.

Antrimolite.—A mineral substance, being a hydrous silicate of alumina with lime and potash, occurring in stalactitical masses about the length and thickness of a finger, adhering to the summit of cavities in an amygdaloidal rock. Found in Ireland, on the shore near Giant's Causeway.

Antrostomus.—A genus of goatsuckers, to which the *Whip-poor-Will* belongs. See CAPRIMULGIDÆ.

Apatite.—A mineral substance composed of phosphate of lime with fluoride of calcium, found in the tin veins of St. Michael's Mount, Cornwall, and also in those of Bohemia and Saxony; and at one time proposed to be used as an artificial manure as a substitute for phosphate of lime.

Apetalæ (*α*, priv.; *πεταλον*, flower leaf).—Plants without petals. A division of plants according to the nat. arrangement, containing all those dicotyledonous plants which have a calyx but no corolla. By some they are called *Monochlamydeous*.

Aphaniptera (*αφανης*, obscure, not manifest; *πτερον*, a wing).—An order of apterous haustellate insects, composed entirely of the different species of fleas, and forming the family *Pulicidæ*. There are a good many species. The common flea, *Pulex irritans*, is too well known to need any description. The female deposits her eggs, generally about a dozen, in any favourable situation, such as carpets, the flue or dust under beds, &c. In six days the larvæ are hatched, attaining their full size in ten or twelve days more; being then nearly a quarter of an inch long, when they cast their skin and change to the chrysalis state. In twelve days more the flea emerges a perfect insect. The chigoe, *Pulex penetrans*, is a native of South America and the West Indies, in which countries it is an exceedingly annoying, and even sometimes a dangerous insect. It attacks the naked feet, penetrates the skin, gets quite out of sight, and there remains to rear a numerous progeny. In this way the most troublesome ulcers are produced, which, if neglected at first, are very difficult to heal.

Aphelandra.—A genus of flowering plants. See ACANTHACEÆ.

Aphidæ.—A family of homopterous insects popularly known as *Plant lice*; and exceedingly interesting both economically from the ravages they commit, and philosophically from their peculiar habits. In autumn, the mother aphis deposits her eggs in some place she selects suitable for her purpose. In winter the parents die, but the eggs remain unhurt, and in spring, when genial weather returns, they are hatched. The young thus ushered into the world are all wingless and all females, and, notwithstanding there being no males, they are all fertile, and being *viviparous* at this season, soon bring forth a progeny of wingless females like themselves. During the summer, ten or eleven generations are thus produced successively from each female, every one so born being the mother of a fresh brood, so that at the end of the season, the mother of the first brood may be the progenitor of 10,000 million millions! In autumn, males are born. These impregnate the last generation which are *oviparous*, and lay fecundated eggs, the young from which do not require fresh impregnation. The aphides are remarkable for secreting a sweet viscid fluid, known by the name of honeydew, which ants and bees are very fond of. They are found on almost every kind of plant, and upwards of 300 species have been described. Their ravages are sometimes terrible. The mischief caused by the aphis of the hop, *Aphis humuli*, in some seasons, as in 1802, have brought the duty of hops down from £100,000 to £14,000. The aphis of the rose, *Aphis rosæ*, is well known to every one familiar with a garden. The apple and pear trees are subject to the same pest; and the vine also is frequently injured by their attacks. The *Aphis rapæ* was at one time attempted to be proved the cause of the potato disease, and was described as the *Aphis vastator*. From what has been said of their enormous fertility, it is not surprising to see such immense clouds of aphides suddenly appear at any place as we occasionally do. The larvæ of the *Coccinellæ*, or lady birds, several ichneumonidæ, &c., devour great numbers. The best method of destroying them, however, is to water the plants with an infusion of tobacco in water.

Aphodiidæ.—A tribe of insects belonging to the order *Coleoptera*. It is numerous in species. They are of small size, and either live in dung or in decaying vegetables, principally marine. They are very common in England. The genus *Aphodius* has more than 150 species described, half of which are European. They are met with in the return of spring. They walk slow, but fly fast.

Aphodius. — A genus of beetles. See APHODIIDÆ.

Aphrodita = Aphroditidæ (*αφροδιτη*, name of Venus).—See ANNELIDA.

Aphrophora.—A genus of insects. See CERCOPIDÆ.

Apidæ.—A family of insects belonging to the order *Hymenoptera*;—containing those insects which are commonly called bees. The species are numerous, and they possess a long proboscis which distinguishes them from the *Andrenidæ*. They are divided into several large groups as the *Panurgidæ*, solitary bees, which resemble the andrenidæ, and of whose habits little is known correctly. The *Melectidæ*, or cuckoo bees, which are parasite, making use, as the cuckoo does, of the nests of other species. The *Megachilidæ*, containing a number of species, which, from their respective economy, are called mason bees and upholsterer bees. The species of the genus *Osmia*, construct their nests of minute grains of sand, cemented together with a glutinous secretion, and placed by the insects on the angle of a wall, the crevices between bricks, the inside of empty shells, &c. A species nearly allied, belonging to the genus *Anthocopa*, is called the tapestry bee, from its using portions of the wild scarlet poppy to form its nests. The species of the genus *Megachile*, or leaf-cutting bee, on the other hand, form their nests in the trunks of decayed trees, in old rotten palings, &c., and line them with pieces of leaves of a circular form, which the insects have most dexterously cut off and adjusted so admirably, that although not covered with any coating of gum, they are honey tight. The genus *Anthidium* belongs to this group. See ANTHIDIUM. The *Scopulipedes* are named and characterized from the females having a very thick coating of hair upon their hind legs. They form their nests in the crevices of old walls, or in the ground, as *Anthophora retusa* for instance, a common British species, and make a loud humming noise when they fly. Among them also are the carpenter bees, *Xylocopa*, which tunnel into wooden posts, palings, &c., forming burrows to the length of twelve or fifteen inches, and half an inch in diameter. When these burrows or tunnels are completed, the female deposits an egg at the bottom with a proper supply of pollen paste. This is covered with a layer of agglutinated saw-dust, forming the floor for another cell, which is placed immediately above it. About a dozen cells are thus formed, one above another. These four groups are all solitary bees; differing in this respect from the succeeding, called *Sociales*, which contains those species which live in communities or societies. Amongst these is the genus *Bombus*, or humble bee, which forms its nest under ground, in meadows, hedge rows, &c., and lives in societies consisting generally of fifty or sixty individuals, but sometimes many more. There are several species of the genus. The best known example of this group, however, is the hive bee, *Apis mellifica*. This well known and valuable insect lives in societies of thousands of individuals, consisting of three different sorts, —males, neuters, and females. The neuter or working bees form the mass of the population, reckoning in a well stocked hive 15,000 or 20,000—and their business is to collect honey, pollen, and propilis, to build the combs, and attend upon the young. They are called neuters, but in reality they are females, which, from different circumstances, are not developed sufficiently to have ovaries—though it would appear from observation that their larvæ, when placed in a larger cell and fed upon proper food, can be converted into a female bee, fit to become a queen or a mother to the hive. The males are called drones. They are only useful in propagating their species, and when the female becomes impregnated they are put to death. Their number in a hive varies from 600 or 700 to 2,000. The females are called queens. Only one is allowed in a hive. If several should be hatched at once, the strongest stings the others to death and takes the command. The only business of the queen is to deposit her eggs in the cells formed by the workers; and it is asserted she will lay from 70,000 to 100,000 eggs in one season. The queen is the largest of the three sorts; the workers are the smallest. These two kinds are armed with stings; the males have none. The habits and manner of living of the hive bee are full of interest; and the construction of the combs of which the interior of a hive consists, "is a miracle which overwhelms our faculties;" though no one can fail to see that by "these creatures and their instincts, the power, wisdom, and goodness of the GREAT FATHER of the universe are loudly proclaimed."

Apiocrinus.—A genus of fossil *Crinoidea* belonging to the oolitic formation. The root has but slight attachments and the stalk is very long, showing that in all probability the species lived at great depths, or in the hollows of coral banks, in the neighbourhood of which they are always found.

Apion.—A genus of insects belonging to the order *Coleoptera*, and family *Curculionidæ*. It is the most numerous genus of the family, and the species are the smallest of all the curculios.

Apis. *The Bee.*—See APIDÆ.

Apistes (*απιστος*, treacherous).—A genus of acanthopterygious fishes belonging to the family *Scorpænidæ*. The species are characterized by

their suborbital plates being armed with a long, sharp, very moveable spine, which the fish can project from its cheek at pleasure, and of which it can make an offensive weapon. In a state of repose this spine is concealed. The species live in the Indian seas, and some of them have the pectoral fins very large, so that they can fly out of the water, like the flying fishes. One of the species, *A. Israelitorum*, is found in the Red Sea. Ehrenberg found it in great abundance at Tor, under Mount Sinai, and believes that these fishes were what the Israelites fed upon during their wanderings on the shores of the Red Sea, and which the translators of the Bible, according to him, have erroneously called quails.

Apocynaceæ. *The Dog-banes.*—A natural order of the monopetalous division of dicotyledonous flowering plants. The species are numerous; trees or shrubs; their stems usually yielding copious milk, and chiefly natives of tropical regions. Many are poisonous, some are possessed of medicinal virtues as cathartics; and a few yield edible fruits. One of the most deadly plants belonging to the order is the *Tanghinia venenata* (*Cerbera Tanghin*) of Madagascar, from the seeds of which is procured the famous Tanghin poison, used formerly in that island as an ordeal in cases of criminals. The oleander, *Nerium oleander*, which is peculiar for having the anthers terminated by feathery appendages, is also poisonous. The roots of the species of *Apocynum* and *Allamanda* are emetic and cathartic, and even our periwinkles (*Vinca*), common plants in this country, are astringent and acrid. The milky juice which is so abundant, and in which generally these active qualities reside, is not always poisonous, for the juice of the *Tabernæmontana utilis*, the hya-hya, cow tree, or milk tree growing in Demerara, is so bland as to be used by the residents as milk. Many of the plants of the order supply caoutchouc, such are the *Urceola elastica*, *Vahea gummifera*, and *Willughbya edulis*. The *Wrightia tinctoria* yields a dye like the indigo, while the pods of the *Apocynum caudatum* and *A. villosum* of Vera Cruz afford a cottony down which is in great request for stuffing chairs, making quilts, &c. The French call it *Delawad*.

Apocynum.—See APOCYNACEÆ.

Aptenodytes. — A genus of birds. See ALCIDÆ.

Aptera (*a*, priv.; πτερον, wing).—An order of insects in the Linnæan arrangement, characterized by having no wings. This order contains the *Fleas*, &c.

Apteryx (*a*, priv.; πτερυξ, a wing).—A genus of birds. See STRUTHIONIDÆ.

Apiornis.—A genus of fossil birds. See DINORNIS.

Aptychus.—See AMMONITIDÆ.

Apus.—A genus of entomostracous crustaceans. See PHYLLOPODA.

Aquifoliaceæ. *The Holly family.*—A natural order of the monopetalous division of dicotyledonous flowering plants. The species are evergreens, and consist of trees or shrubs, growing in Europe, North and South America, and Africa. They possess astringent and tonic properties. The common holly, *Ilex aquifolium*, a native of this country, contains in its leaves and bark tonic and febrifuge qualities, while the berries are emetic and purgative. It forms excellent fences and hedges; and many of our readers may have seen the holly hedges at Tynningham, in East Lothian, where they extend to a length of 2,952 yards, are from 10 to 23 feet in height, and most of them are upwards of 130 years old. The custom of decorating churches and houses with holly branches at Christmas, which is still practised, is of very ancient date. The *Ilex Paraguayensis* furnishes the Yerba Maté or Paraguay tea, and is extensively used in some districts of South America. The leaves yield the bitter principle called theine, which exists in tea. Two species of the genus *Myginda*, natives of South America, *M. uragoga* and *M. Gongoutha*, are diuretic, and a decoction of the roots is used by the natives for that purpose. Some of the species of winterberry, *Prinos*, possess the same properties. The bark of the whorled winterberry, *P. verticillatus*, a native of North America, is bitter, and has been substituted for cinchona bark in the treatment of fever. It is antiseptic, and is used in America as an application to gangrenous sores, and in infusion or decoction, as a lotion in cutaneous diseases. The leaves of the *P. glaber* are used in America for making tea.

Aquila. *The Eagle genus.*—See AQUILINÆ.

Aquilaria.—See AQUILARIACEÆ.

Aquilariaceæ.—A natural order of the apetalous division of dicotyledonous flowering plants. There are but few species. They are trees, and natives of the tropical regions of Asia. From one or two species of the genus *Aquilaria* is obtained the aloes wood of commerce, or agallochum, an exceedingly aromatic highly-scented wood, which is in very high repute in all Hindu, Mohammedan, and Catholic countries, for fumigations and incense. The *A. Malaccensis* or *ovata* is called eagle-wood or Bois d'Aigle. The *A. Agallochum* is probably the "trees of aloes" or the "ligne aloes" of the Bible. The *A. secundaria* is, perhaps, the most highly scented, but it is only when the tree has become subject to a peculiar disease, during which it secretes a resinous matter, somewhat resembling camphor in its properties, that it becomes odoriferous. The diseased portion is strongly perfumed, while the healthy portions of the tree are perfectly inodorous and of no value. The Cochin Chinese are said to make their paper of this species of *Aquilaria*.

Aquilinæ. *The Eagles.*—A sub-family of birds belonging to the order *Accipitres* and family *Falconidæ*. The eagles are characterized by

having a very strong compressed bill, suddenly curved at the top, and the margins are festooned. The tarsi are feathered down to the base of the toes. They have been from time immemorial considered pre-eminent amongst birds for courage, strength, and boldness; and they have been celebrated as being equally magnanimous as they are fierce and voracious. The character assigned to the lion amongst quadrupeds has been given to the eagle amongst birds. Poets have delighted to do honour to him they called the "king of birds;" and in the mythology of Greece and Rome, the eagle was chosen as the associate of Jupiter, fondly and proudly termed the "bird of Jove," and considered as the true emblem of dignity and might. This poetic character of the eagle, however, is considerably exaggerated, and, as a family, the *Aquilinæ*, or eagles, are inferior in many points to the falcons. See FALCONINÆ. In many respects, however, they are a noble race of birds—large, strong, and powerful on the wing, of an astonishingly acute sight, and with such curiously organized eyes that they can look steadfastly on the sun, and endure his dazzling rays without flinching. Eagles are found in all the four quarters of the globe. The golden eagle, *Aquila chrysaetos*, the largest and noblest of the European species, is the type of the family. It inhabits the great forests of Europe, more especially the northern parts, the mountainous regions of Asia, and, though not very common, the subalpine parts of North America. It preys on lambs, fawns, and small quadrupeds, and on large birds, and, when pressed with hunger, will even devour carrion. The golden eagle is not uncommon in Scotland, and a full grown bird will measure three feet three inches in length, with an extent of wings of seven feet six inches, and will weigh from twelve to sixteen pounds. It is said to be very long-lived, and a specimen is recorded to have lived at Vienna, in confinement, for 104 years. The harpy, or imperial eagle, *Thrasaëtus harpyia* (the *Falco imperialis* of Shaw, *Harpyia destructor* of Cuvier, and the *Vultur harpyia* of Linnæus), is, perhaps, the largest species of the family known. It measures three and a-half feet in length, and is remarkable for the crest of feathers of a dull black, edged with grey, with which its head is adorned, its short wings, and very robust legs and talons. It is a native of Mexico and several parts of South America, and is an extremely powerful bird, Linnæus asserting that it could split a man's skull with one blow. The harpy is a solitary bird, frequenting the deepest forests, where it feeds upon sloths, monkeys, fawns, and other quadrupeds, but it is said will attack the fiercest animals, and even man himself. It builds its nest on the highest trees, and constructs it of the bones of the animals it has killed, mixed with dry branches of trees, and bound together with the ends of climbers. The wedge-tailed eagle, *Aquila fucosa*, is a noble species, a native of Australia. It is the *Wol-uja* of the aborigines, the *Eagle-hawk* of the colonists, or the *Mountain Eagle of New South Wales*. What the golden eagle is to the northern hemisphere the wedge-tailed eagle is to the southern, universally spread over the southern portion of Australia, numerous in Van Diemen's Land, and common on the larger islands of Bass's Straits. It frequents chiefly the interior parts of the country, and feeds upon the smaller species of kangaroo which abound in the hills and plains. Of great power and ferocity, the wedge-tailed eagle has now also become the scourge of shepherds and sheep-farmers, destroying great numbers of lambs annually. Though preying chiefly upon live animals it will not disdain carrion, and will follow the kangaroo hunters for many miles and days together for the refuse left by them. A full-grown specimen of this fine bird will measure six feet eight inches in extent of wings, and weigh upwards of nine pounds. The sea eagle, bald eagle, or white-headed eagle, *Haliaëtus leucocephalus*, is another very distinguished species of this family, which inhabits North America, and feeds chiefly on fish. It is an occasional visitant of the Old World, but is principally met with in the United States. It is a very voracious bird, attacking the fish-hawk, or osprey, after it has caught a fish, and forcing it to relinquish its prey, devouring young pigs, lambs, fawns, &c., and gorging itself even with carrion. The sea eagle has been adopted by the United States of America as their national symbol, though Benjamin Franklin does not seem proud of the emblem. "For my part," he says, "I wish the bald eagle had not been chosen as the representative of our country. He is a bird of bad moral character; he does not get his living honestly. You may have seen him perched on some dead tree, where, too lazy to fish for himself, he watches the labours of the fishing-hawk; and when that diligent bird has at length taken a fish, and is bearing it to his nest for the support of his mate and young ones, the bald eagle pursues him and takes it from him. With all this injustice, he is never in good case, but, like those among men who live by sharping and robbing, he is generally poor and often very lousy. Besides, he is a rank coward; the little king bird, not bigger than a sparrow, attacks him boldly, and drives him out of the district. He is, therefore, by no means a proper emblem for the brave and honest Cincinnati of America, who have driven all the king birds from our country; though exactly fit for that order of knights which the French call Chevaliers d'Industrie." The fishing eagle, bald buzzard, fish hawk, or osprey, *Pandion haliaëtus*, is also a native of America, though it is likewise found in Scotland and Ireland. It lives principally upon fish, which it takes by dashing from on high into the water with great force and velocity. Unlike the other species of this family, the osprey may be considered almost gregarious.

They build their nests so near each other that three hundred nests, with young, have been counted on one small island near New York. In this eyrie they live as peaceably as rooks, and are even looked upon as harmless by other birds in their neighbourhood. Many other species of this family have been described, such as the vulturine eagle, *Pteroaëtus vulturinus*, of Caffraria; the Brazilian eagle, *Morphnus Urubitinga*, a native of Brazil and Guiana; the Jean le Blanc of the French, *Circaëtus gallicus*, inhabiting the fir forests in the eastern parts of the north of Europe, and feeding chiefly on lizards and serpents; with others too numerous to mention.

Ara. *The Macaw.*—See PSITTACIDÆ.

Araceæ or **Aroideæ.**—A nat. ord. of monocotyledonous plants to which the genus aram gives the name. The species are numerous and widely dispersed, though they abound most within the tropics. The order contains four tribes:—1st, The *Arineæ* or cuckoo-pint tribe. 2d, The *Typhineæ* or bulrush tribe. 3d, *Acoreæ* or sweet-flag tribe. 4th, The *Pistieæ* or duckweed tribe. The general property of the order is acridity, and some are even dangerous poisons. The *Caladium seguinum* or dumb cane of the West Indies, when simply chewed, causes the tongue to swell and beome paralyzed. When boiled or roasted, however, the rhizomes, or underground stems, are often used as food. Such are the cocos (*Colocasea?*) which are substituted for potatoes and yams. Some of these roots also abound in starchy matter, and the kind of sago called Portland sago is obtained from the *Arum maculatum* or common cuckoo-pint of this country. The young shoots of one or two species of *Typha*, as, for instance, the *T. latifolia* or great reed mace, and *T. angustifolia* are eaten by the Cossacks like asparagus. The *Lemnæ*, or duck-weeds, are found floating in green masses upon every pond in this country, and the *Pistiæ* on those of the tropics.

Arachis.—A genus of plants belonging to the nat. ord. *Leguminosæ*. The earth nut, *A. hypogœa*, is peculiar from the manner in which its fruit is produced and ripened. Instead of being placed at the bottom of the calyx as is the case with other leguminous plants, the young fruit is found in the interior, and at the bottom of a long tube which looks like a flower stalk. This fruit, instead of hanging down from among the leaves, as in other plants, buries itself in the ground, and there ripens. The plant is a native of Africa and the East Indies; is much cultivated by the Chinese, the Africans, and Americans, and is eaten roasted as chestnuts. In flavour they are as sweet as almonds. An oil is expressed from them which is scarcely inferior to that of olives, and is often used as a substitute.

Arachnida = Arachnoidæ (ἀραχνη, a spider).—A class of articulated animals, comprising the spiders, acari, scorpions, and the little creatures called sloths or tardigrada. The *Arachnida* are usually described as differing from insects (with which Linnæus placed them) in having no antennæ. Instead of which, the fact is, they have no mandibles, the organ usually called such being in reality the antennæ metamorphosed into prehensile and masticatory parts. They have always four pairs of feet, and the external envelope, as in all the *Arthropoda* or articulated animals, consists chiefly of chitine, the tardigrade forming no exception in this respect. The eyes are simple stemmata, and vary so much that they are used by zoologists to characterize the genera. In the higher forms the circulatory system consists of a heart and a regular system of more or less developed blood-vessels; but in the lower these are wanting, and the blood is distributed free in the interstices of the body, and is moved in an irregular manner hither and thither by the aid of muscular movements and contractions of the intestinal canal. The blood in all is colourless. The respiration is carried on in the higher forms by tracheæ, or by lungs and tracheæ together; but in the lower, no traces of respiratory organs have been found; these animals must breathe, therefore, through the skin. Most of the *Arachnida* have poison glands, generally two, the product of which is excreted through the extremity of a hollow claw, and the true spiders have a peculiar apparatus for spinning a web. This consists of a series of glands situated in the midst of the abdominal viscera, and secreting a viscous, transparent liquid, which hardens quickly on exposure to the air, forming threads, and escaping by two or three pairs of conical papillæ called *spinnerets* situated behind the anus. With the majority of the arachnida the young undergo no metamorphosis, but escape from the egg in the form of the adult. But the lower orders undergo some slight changes before they are perfect. In the *Acarides*, for instance, the young have only three pairs of feet; and the water spiders, or *Hydrachnæ*, have, in addition to this, a very long snout, which might easily be taken for a head distinct from the trunk. This class may be divided into the four following orders:—I. The cephalothorax many jointed; special respiratory organs wanting. This order contains the sloth (see TARDIGRADA).—II. Cephalothorax one or two jointed only; respiratory organs consisting of tracheæ. To this order belong the mites and ticks (see ACARIDÆ).—III. Cephalothorax one jointed, distinct from the one jointed abdomen; respiratory organs consisting of tracheæ and lungs. To this order belong the true spiders (see ARANEIDÆ).—IV. Cephalothorax one jointed; abdomen many jointed; respiratory organs consisting only of lungs. To this order belong the scorpions (see SCORPIONIDÆ).

Aralia.—A genus of plants. See ARALIACEÆ.

Araliaceæ. *The Ivy family.*—A nat. ord. of dicotyledonous plants, and nearly allied to

the *Umbelliferæ*. Many species are described, amongst which is the common ivy, *Hedera helix*. They have generally aromatic and stimulant properties. The succulent fruit of the ivy is emetic and purgative. The famous Ginseng root, so much esteemed by the Chinese as a stimulant and aphrodisiac, is the product of a species of *Panax*. A species of the same genus is a native of America, *P. quinquefolium*, and possesses qualities resembling those of Ginseng. Some species of the genus *Aralia* yield an aromatic gum resin. The *A. nudicaulis*, a native of North America, has fragrant and aromatic roots, which possess a sudorific property, and are used as a substitute for sarsaparilla. *A. spinosa*, called in North America *Toothache tree*, is a stimulant diaphoretic. The roots of *Gunnera scabra*, a native of the sandstone cliffs of Chiloe, are used by tanners on account of the tannin they contain.

Araneidæ.—The third order of the class *Arachnida*. See ARACHNIDA. This order contains the true spiders, a numerous and most interesting set of animals. The far greater number are terrestrial, a few only living in the water. Of the terrestrial (I.), some are what are called hunting spiders. These are incessantly leaping or running about the vicinity of their abodes to chase and catch their prey. Some of these hide in holes and fissures, as the great bird spider, *Mygale*, which has two pulmonary sacs and two spiracles on each side, and has eight eyes. The species form their nests in slits of trees beneath the bark; in the cavities of stones or rocks, or on the surface of leaves of various vegetables. The cell of *M. avicularia* is in the shape of a tube narrowed into a point at its posterior extremity. It is composed of a white web of very fine texture, semi-transparent like muslin. These are the giants of the spiders; some species, while in a state of repose, occupying a circular space of six or seven inches in diameter. They are said to attack and kill humming birds. Others enclose themselves in tubes, which they form in the earth, and line with a sort of silk—such as the *Cteniza*, or trap-door spider, which has only six

Nest of *Cteniza*—The Trap door Spider.

eyes. They construct at the entrance of this tube a lid or door formed of earth and silk which moves by means of a hinge. When shut, it is scarcely to be distinguished from the neighbouring soil, and when opened by force, is so elastic that it immediately returns to its former position. *C. nidulans* is a native of the West Indies, and has long been known, forming its tubular nest in the loose rocky soil. Another species is a native of the Ionian Isles, *C. Ionica*, and forms its nest at the roots of trees. Many others are described. Other species of these hunting spiders do not spin webs, but are fast runners, and seize their prey by coursing it down. They have only one pulmonary sac, and one spiracle on each side, and have eight eyes. Such are the wolf spiders, *Lycosa*. These generally live on the ground, upon which they run with great swiftness, their dwelling-places being holes in the earth, or in walls, lined with silk. A species of this genus is the well-known *Tarentula* spider, *L. tarentula*, which was considered to be very poisonous, its bite producing the disease called *tarentism*, only to be cured by music and dancing. Allied to these are still another set of hunters which do not run, but leap and spring with great agility to seize their prey. Such is the leaping spider, *Attus*, which forms a silken nest in the form of an oval sac, into which it can retire. When these spiders observe a fly or other object of prey, they approach it cautiously till they come within leaping distance, when, by a sudden spring, they dart upon it. II. A second division of terrestrial spiders are wandering spiders, or *Vagabonds*. These have no fixed residence, except at the period of laying their eggs, and they keep wandering abroad, and incessantly spying out for prey. The species belonging to this division have only one pulmonary sac and one spiracle on each side. They are generally depressed in shape, the fore legs larger than the others, and they can walk like crabs sideways or backwards; hence they are called crab spiders. Such are the species of *Thomisus*. They do not form webs, but throw out a few solitary threads in order to catch their prey. III. A third set of terrestrial spiders are prowlers, either making a web for their nests whence issue threads to entrap their prey, or spreading long threads of silk about the places where they prowl to catch them. They go abroad, but prowl chiefly in the neighbourhood of their nests or threads. They are also called tapestry weavers. Such are the species of the genera *Clubiona* and *Drassus*, which take up their abode under stones, in holes of walls, or in the interior of leaves, and form silken tubes or cells; and of the genus *Clotho*, which constructs, on the under side of stones, or in crevices of rocks, a cocoon in shape of a cup an inch in diameter. IV. A fourth set are sedentary spiders. These also have only two pulmonary sacs and two spiracles, and most have eight eyes. They spin large webs to entrap their prey, and lie in wait themselves in the

middle of it or on one side. Some spin great webs of a close texture like hammocks. Of these is the domestic spider, *Tegenaria civilis* (= *Aranea domestica*, Linn.), which constructs large webs (cobwebs) in the interior of our habitations, in the angles of walls, upon plants and hedges, &c. At the upper part of this web is a tube in which the spider lies without motion. Others spin webs of a regular and open texture, either orbicular or spiral, which they spread abroad, but remain themselves in the middle, or on one side, to catch their prey. Such are the species of *Epeira*. Our common garden spider, *E. diadema*, is a large species, very prettily marked, and is very abundant in autumn. The web is a beautiful construction, and the threads of which it is composed are in great request for the division of the micrometer. One species which is a native of tropical countries, weaves a web the threads of which are strong enough to entangle birds, and even, it is said, to prove troublesome to the passage of man himself in travelling through the woods. The nets of some large spiders of this division, belonging to the genus *Nephila*, are of different colours, white, yellow, blue, and green; and in Mexico there is one composed of red, yellow, and black threads, interlaced with great and singular ingenuity. Of the aquatic spiders there is but one genus, *Argyrometra*, the species of which swim in the water, and there spread their filaments to entrap their prey. The *A. aquatica*, or diving water spider, lives in standing pools of water, in which it swims with its abdomen encased in a bubble of air. It constructs also in the water an oval cocoon or sac, filled with air, and formed of silk, which acts as a sort of diving bell. This sac sends out threads in all directions, which the spider fastens to plants under water. Moored in this manner the little creature here takes up its abode, devours its prey, constructs its egg case, and passes the winter, having first carefully closed the cell.

Araucaria.—A genus of dicotyledonous plants belonging to the nat. ord. *Coniferæ*, and tribe *Abietineæ*. The species are natives of the southern hemisphere, and are all more or less gigantic trees. *A. excelsa*, the Norfolk Island pine, is a native of Norfolk Island, New Caledonia, Isle of Pines, and of some parts of the east coast of Australia. It is a majestic tree, growing to the height of from 160 to 228 feet, with a circumference of sometimes more than 30 feet. The bark abounds in turpentine, and the wood, which contains none, is white, tough, and close grained. It is, however, so heavy and so frequently unsound, that the expectations of its being of great use for the navy in making large spars has ended in disappointment. One or two other species of nearly equal dimensions have been described.

Araucarites.—Some interesting fossil plants of the coniferæ have been found in the carboniferous system of rocks. In Craigleith quarry, near Edinburgh, some specimens upwards of seventy feet long, of a species closely resembling the *Araucaria excelsa*, have been discovered. Specimens occur also in the lias of Lyme Regis. These have been described under the name of *Araucarites*. It is an interesting fact to find that trees closely resembling recent Australian species must at one period of our globe's existence have flourished in Great Britain.

Arbutus.—A genus of dicotyledonous plants. See ERICACEÆ.

Arcadæ. *The Ark Shells.*—A family of conchiferous mollusca, the species of which are remarkable for the number of teeth connected with the hinge. They are natives of the Atlantic and Pacific Oceans, the Mediterranean Sea, and our own shores. They burrow in the sand near the coasts, and are also sometimes attached to rocks, stones, &c. A considerable number of species have been described.

Archegosaurus.—A genus of fossil reptiles. It has the body of a toad, the jaws and teeth of a lizard, and the skin was covered with long, narrow, tile-like horny scales, arranged in parallel rows.

Archibuteo.—A genus of raptorial birds. See BUTEONINÆ.

Arctictis. *The Binturong.*—A genus of animals belonging to the class *Mammalia*, order *Ferœ*, family *Felidæ*, and sub-family *Viverrina*. The best known species is the white fronted binturong, *A. Binturong*, or *albifrons*, an inhabitant of Nepâl, about the size of a large cat, with a strong tail, which is useful to the animal in climbing trees. The body is long and heavy, the legs short, and the gait low and crouching. It is most lively in the evening.

Arctiidæ.—A family of nocturnal insects belonging to the order *Lepidoptera*. They are known by the name of tiger moths. The *Arctia Caja*, or common tiger moth, is a remarkably beautiful insect, from two and a-half to three inches in the expanse of the fore wings, which are of a rich brown colour, with numerous irregular spots, and streaks of cream white; the hind wings bright red, with blue black spots. The larvæ or caterpillars of the tiger moths are thickly clothed with long hairs, and are known by the name of "woolly bears." The *A. chrysorrhœa* is a species, the larvæ of which sometimes produce great destruction among fruit trees. The eggs are laid in beautiful rings around the stem of the tree, and in the spring the larvæ make their appearance. They are gregarious, and form a large web, to which they retreat at night and in wet weather. Their numbers are sometimes so great as to become a serious calamity. In 1783 they were so destructive in the neighbourhood of London that subscriptions were opened to employ the poor in cutting off and collecting the webs; and it is asserted that not less than eighty bushels were collected and burnt in one day in the parish of Clapham. In some places prayers were offered up in the churches to avert the calamities of

which they were supposed by the ignorant to be the forerunner.

Arctomys (*αρκτος*, a bear; *μυς*, a mouse). *The Marmot.*—A genus of quadrupeds belonging to the order *Rodentia* or *Glires*. There are a considerable number of species, some inhabiting the southern mountains of Europe, particularly those of the Alps and Pyrenees, just below the regions of perpetual snow; others in the north of Europe and northern parts of Asia, and some are found in North America. They live in communities, and have extensive burrows on the sides of high and cold mountains, where they form magazines of corn and nuts. They sit like squirrels while they eat, and generally bring forth from five to eight young. They pass the winter in a dormant state. The Alpine marmots, *A. alpinus*,

Arctomys alpinus—The Alpine Marmot.

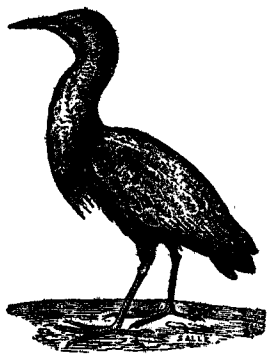
live in large societies, and when they are feeding they post a sentinel, who, on the approach of any danger, gives a shrill whistle, when they all retire into their burrows. The prairie dog of America, *A. Ludovicianus*, is a species which lives in extensive communities in the wide prairies of North America; their villages, as the hunters term their burrows, extending sometimes many miles in length. They resemble the squirrel in general appearance; but the name prairie dog has been given it, from a supposed resemblance between its warning cry and the barking of a small dog.

Arctostaphylos. *The Arbutus Urva Ursi.*—See ERICACEÆ.

Ardea. *The Crane.*—See ARDEIDÆ.

Ardeidæ. *The Heron family.*—A family of birds belonging to the order *Gralliæ*, or wading birds. They have long hard bills, long and slender tarsi, and toes lengthened and furnished with acute curved claws. The neck is long and slender, the back generally much arched, wings usually rounded, and the tail mostly short and even. These birds are formed for wading, and generally seek their food on the margins of rivers and lakes, and in marshes, where they obtain fish, reptiles, and even small mammalia. They commonly build and breed in societies, but always wander alone in search of food, and after the building season lead a solitary existence. They have large wings, and many are adorned with elegant plumes and crests. This family contains many genera, and numerous species. They have been divided into several sub-families, differing in many things from each other. The *Psophinæ* have loud and harsh voices, and feed on grain and fruits. Some are called trumpeters. See PSOPHIA. Others are called screamers, *Cariama* or *Palamedea*, have discordant voices, and subsist on lizards and insects, which they hunt for on high grounds and on the skirts of forests. They are remarkable for having sharp hard spurs on their wings at the shoulder joint, which are efficient weapons for enabling them to resist the attacks of snakes which infest the places they inhabit. These birds (the *Psophinæ*) have been variously placed by ornithologists, but at present they are considered to be more nearly related to the large family of *Ardeidæ* than any other. The *Gruinæ*, or cranes, are more elegant looking birds than the preceding sub-family. They feed on corn and small reptiles, and frequent humid grounds in rather numerous flocks. They are slow in their motion, and have singular habits of attitudinizing, circling around each other with expanded wings, and with a light and tripping step. The balearic cranes, *Balearicæ*, have the back of the head adorned with a peculiar bushy crest, and the throat furnished with fleshy wattles. They are natives of Africa, perch with facility, and are readily domesticated. They are held in veneration by the natives of Guinea, who will not allow any one to shoot them; being one of their "fetish." The common crane, *Megalornis cinerea*, is the only European species, and is sometimes, though rarely, seen in England. This bird has long been celebrated for its regular migrations. In summer they spread themselves over the north of Europe and Asia, as far as the Arctic circle; and in winter they are found in India, Syria, and Egypt, &c., their journey being performed in regular well-ordered flocks. Poets frequently allude to them, and they were well known to the ancients. The Siberian crane, *Grus gigantea*, inhabits the great marshes and lakes of Siberia; while the brown crane, *Grus Canadensis*, is found in North America, migrating northward in the spring to breed, and returning to the south in autumn. The demoiselle crane, *Scops* (*Anthropoides*) *virgo*, is perhaps the handsomest of all the species of this sub-family. It is remarkable for the grace and symmetry of its form, and the elegance of its deportment. The manner in which it inclines itself with several bows as it rather ostentatiously walks along, and the gaiety of its leaps and bounds as if it wished to dance, have all conspired to give it its distinguishing name of "demoiselle." The ancients knew it, and called it the comedian, from its

gestures. It is a native of many parts of Asia and Africa, and is to be met with along the whole of the southern and eastern shores of the Mediterranean. The *Ardeinæ*, or herons, are distinguished by the inner edge of the claw of their middle toe being pectinated, and their eyes being placed in a naked skin which extends to the beak. They are inactive birds, nestling and perching by the sides of rivers, and living chiefly on fish. The true herons, *Ardea*, have a very slender neck, with long and pendant feathers towards its base. There are a considerable number of species described from various parts of the world. They build in large societies which are called heronries, and when they fly, the neck is contracted and folded over the back, and their legs are extended. The common heron, *Ardea cinerea*, is found native in the greater part of the Old World. It is a permanent resident of England and Scotland. It subsists chiefly on fish, and is generally thought to commit great havoc amongst the finny tribe in ponds and shallow waters. Except at the breeding season, the heron lives a solitary life, and may be seen taking his stand in gloomy solitude by the side of a lake watching patiently for its prey. This it seizes by an instantaneous stroke of the bill, transfixing it if large. This bird soars to a great height; and at one period heron hawking was a favourite diversion amongst the nobility and gentry of the kingdom, at whose tables it was a highly esteemed dish, not less so than pheasants and peacocks. It was ranked among the royal game, and protected as such by the laws. The egrets are distinguished by having feathers on the lower part of the back, which at a certain season are lengthened and thinly barbed. One of the most elegant is the little egret, *Herodias Garzetta*. It is of a pure white plumage, with black beak and feet; its head, breast, and shoulders are adorned with soft, silky, flowing plumes, which give the bird a beauty quite peculiar to itself. These plumes were formerly used to decorate the helmets of warriors, but now they embellish the turbans of Turks and Persians, or the headdresses of European ladies. They are abundant in the south of Europe, perching and building in trees, and are said to have been at one time common in this country. The night heron, *Nycticorax griseus*, is widely distributed over Europe, Asia, and America, though not numerous. It frequents the sea shores, rivers, and inland marshes. It remains concealed during the day, and does not roam about until the approach of night, when its harsh and disagreeable cry is perfectly distinguishable. The bitterns, *Botaurus*, belong also to this sub-family—shy, solitary birds, never seen on the wing in the day time, but sitting generally with the head erect among the reeds and rushes of extensive marshes, from whence they will not stir, unless disturbed by the sportsman. In its flight, the bittern, *Botaurus stellaris*, might be mistaken for the heron, but may readily be known by its peculiar cry, which it utters from time to time while on the wing. In the breeding season this cry is particularly loud and booming, as it comes upon the



Botaurus stellaris—The Bittern.

ear in the stillness of the night from its swampy retreats. Bitterns are bold birds, and defend themselves courageously. They were formerly held in great esteem at the tables of the wealthy. The spoonbills, *Platalea*, are placed in this sub-family also. They are recognized by their beak being long, broad, and flat throughout its length, but more so at the top, where it forms a round spoon-shaped disc. There are two species pretty well known, the white spoonbill, *P. leucorodia*, a native of most parts of the Old World; and the roseate spoonbill, *P. Ajaja*, a native of America, in Guiana, and Mexico. The *Ciconinæ*, or storks, have the front toes palmated at the base. They have large straight bills, and their mandibles striking against each other produce a clattering noise peculiar to the family. They frequent retired marshes and borders of pools where they prey upon fish, worms, reptiles, and insects. In most countries, storks are held in great esteem by the inhabitants, as they tend to prevent the increase of noxious vermin by destroying great numbers. They migrate in large flocks to immense distances, returning regularly to their former habitations. Among the ancients it was considered a crime to kill them, and thus in some places the stork became like the ibis, an object of worship. They were celebrated from remote antiquity for their great attention to their young, and more especially for their great attention to their parents in old age. The white stork, *Ciconia alba*, is a native of various parts of the temperate regions of the Old Continent, making its nest of dry sticks on high trees, or on the summits of rocky cliffs, or on the tops of steeples, high chimneys, and lofty ruins in the neighbourhood of man, by whom both it and its nest are regarded as sacred. In Holland and Germany they have been observed to return annually to the nest which has cradled many generations. The white stork

arrives in Europe in spring, but the winter is passed in the more genial climates of Asia, and in the northern parts of Africa, Egypt, &c. There are two or three very large species found in India and Africa, which are remarkable for their size. The argala, gigantic crane, or adjutant, *Leptoptilos Argala*, is a native of India, and generally

Leptoptilus Argala—The Adjutant.

stands five feet in height, though it not unfrequently attains that of six or seven. It is extremely useful in removing noxious animals, and devouring all sorts of carrion. It is called the scavenger in Calcutta, and a fine of fifty rupees is inflicted upon any individual who wantonly kills one of them. These birds furnish the fine plumes called cornacauly feathers. They fly very high, especially in the hot dry season. The marabou, *Leptoptilos Marabou*, is a native of Senegal, and is smaller than the adjutant. They furnish beautiful lightly floating plumes, superior in estimation to those of the ostrich, and known by the name of marabou. One of these feathers, measuring 11¾ inches in length, and seven inches broad, weighs only eight grains. Both of these species are remarkable for the comparative nakedness of the head and neck, and a kind of pouch which hangs externally in front of the neck. The *Tantalinæ* are much like the storks, but their long arched bills are rounded at the culmen. There are several genera, amongst which the ibises are the most remarkable. The sacred ibis, *Ibis Ethiopica*, is a native of Africa, and is a migratory species. It makes its appearance in Egypt as soon as the waters of the Nile begin to rise, and disappears when the inundation terminates. It sometimes lives solitary, but oftener in societies of eight or ten. Its flight is lofty and powerful. This is the species that was held sacred by the ancient Egyptians, and of which such

Ibis Ethiopica—Sacred Ibis.

numbers are found as mummies in the vast catacombs of ancient Memphis. In Abyssinia it is called Abou Hannes, or Father John; and in Egypt, Abou Menzel, or Father Sickle Bill. The glossy ibis, *I. falcinellus*, and the scarlet ibis, *I. rubra*, are also well known species—the former a migratory bird, breeding in India, and migrating periodically to Egypt, passing through Poland, Hungary, Turkey, and the Grecian Archipelago, —the latter living in large flocks in the hottest parts of South America, and of a brilliant scarlet coloured plumage.

Ardeinæ.—See ARDEIDÆ.

Areca.—A genus of plants belonging to the nat. ord. *Palmæ*. Amongst the species of this genus there are two which are remarkable for the purposes to which they are applied. The *Areca catechu*, or betel-nut palm, is one of the most beautiful palm trees of India, growing to the height of forty or fifty feet, with a particularly straight trunk about twenty inches in circumference, nearly of equal thickness its entire length, and quite smooth. It is extensively cultivated throughout India for the sake of the nuts, which are objects of great importance in the East, as they form one of the chief ingredients in the compound the natives universally use as a masticatory, called *Betel*. The powdered nut is wrapped up in a leaf of the betel pepper, with a small portion of *Chunam*, or lime, prepared from oyster shells. This they chew, young and old, rich and poor; and indeed it is used to an extent difficult for an European to conceive. It reddens the lips, and in course of time renders the teeth black. The Areca palm is chiefly cultivated in Malabar, Ceylon, and Sumatra. One tree will produce, according to situation, age, culture, &c., from 200 to 800 nuts. In 1841 and 1842 the imports to Calcutta of this nut amounted annually to 1,966 tons, and in 1837 the imports, in British ships

alone, to Canton, amounted to 1,502 tons. The cabbage palm, *A. oleracea*, is the other species. It is a native of Jamaica and other West Indian islands, and grows to a height of from 100 to 200 feet, with a trunk no more than six or seven inches in diameter. The bark is extremely hard, impenetrable to a musket ball. The leaves grow from the top only, and within the outer leaves there is a white heart of eight or nine inches in circumference. This is called the cabbage, and is esteemed by the natives a great luxury, and eaten by them either raw as a salad, or fried with butter, or boiled. It is said that they will frequently cut down a tree of half a century's growth for the sake of obtaining this single bud or cabbage.

Arecin'eæ.—A tribe of plants belonging to the nat. ord. *Palmæ*, containing the betel-nut palm and some others.

Arenicola (*Arena*, sand; *colo*, to inhabit).—A genus of worms belonging to the class *Annelida*. The best known species is *A. piscatorium*, the lob or lug worm found in the sand of the sea shore, which is much used by our fishermen as a bait. It bores in the sand, and forms for itself a tube, within which the animal moves with perfect freedom. When touched, the lug worm throws out a quantity of a yellow fluid that stains the hand.

Arenicoli.—A name given to a section of insects belonging to the order *Coleoptera*, which live in dung, and form deep burrows in the earth.

Argala. *Adjutant*, or *Gigantic Crane.*—See ARDEIDÆ.

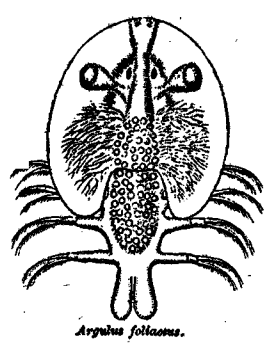
Argas.—A genus of animals belonging to the *Acaridæ*. They live parasitic upon pigeons, fowls, &c.; some live in gardens.

Argentina.—A genus of malacopterygious fishes belonging to the family *Salmonidæ*. The air bladder is thick and loaded with the pearly-looking substance which is used for making artificial pearls.

Argentine.—A mineral substance. A white laminated variety of crystallized calcareous spar containing a little silica.

Argonauta. *The Paper Nautilus.*—A genus of shells belonging to the sub-kingdom *Mollusca*. The shell of the argonaut is thin and translucent, when dry very brittle, but in the water quite pliable. It is involute, and the last whirl is very large and open, while the unoccupied portion of the spire serves as a receptacle for a number of minute clustered eggs. The only inhabitant of this shell that has ever been discovered is a species of cuttle fish belonging to the order *Octopoda*, and named by some authors *Ocythoe*. The shell is not moulded on the body of the inhabitant, nor is it attached to it by any muscles. The cuttle fish has, in consequence, been believed by many naturalists to be merely a parasite, and not the constructor of the shell. This opinion, however, is losing ground, and it is now generally considered that the *Ocythoe* is the real inhabitant and architect of its elegant domicile. The females of the genus *Ocythoe* are remarkable amongst other cuttle fish for having the dorsal arms provided at the ends with a large web-like membranous expansion. By means of these the animal embraces tightly the shell and keeps it in its right position on the body. Aristotle describes it as occasionally raising these arms aloft, and spreading their expanded ends to the breeze like sails; and this delightfully poetic fable has been repeated to the present day, and has again and again been brought forward as the means of teaching mankind the art of sailing. The males of the *Ocythoe* are like the males of the octopods, very different from the females, and very much smaller, and belonging, like them, to the genus *Hectocotyle* of authors.—See OCTOPODA. The manner in which the ocythoe propels its boat is by forcibly ejecting water from the funnel, which causes a recoil, and sends it backward. There are several species of argonauts described.

Argulidæ.—A family of entomostracous crustacea belonging to the order *Siphonostoma*, and containing only one genus *Argulus*. The animals belonging to the genus *Argulus* are characterized by the head and greater part of the body being covered with a large rounded shield-shaped buckler or carapace. They are parasitic upon fresh water fishes, tadpoles, &c., and attach themselves to the bodies of their hosts by means of two round cup-shaped membranes provided with several muscles, which cause them to act as suckers or cupping glasses. Their mouth is furnished with a long sharp pointed syphon or sucking-tube contained within a sheath, by means of which the creature can penetrate the skin of the animals upon which it lives, and suck up its nourishment. The ovary containing the eggs is situated within the thorax of the female. The spawn is deposited upon aquatic plants, &c., and when the young are first hatched they appear of a very different form to that of their parent. At first they are free and unattached, and do not acquire



Argulus foliaceus.

their sucking discs till after they have changed their shell, or moulted for the sixth time—a

process which is repeated every six or seven days until the animal acquires its full growth, and is able to attach itself to some other animal. The *A. foliaceus* is a very pretty and interesting species, and is common in our ponds and lakes, on the stickleback, carp, trout, and pike, &c., more especially if the fishes are not in good health, or have been wounded.

Argus.—A genus of birds. See PHASIANIDÆ.

Argyroneta.—A genus of spiders. See ARANEIDÆ.

Aristolochiaceæ. *The Birthwort family.*—A family of dicotyledonous flowering plants, the species of which are herbs or shrubs, often climbing, and natives of the warm regions of South America, as well as the temperate and cold regions of Europe, Asia, and America. There are many species known, and their qualities are generally bitter, tonic, and stimulant; some are acrid and act as emetics. The leaves of the Asarabacca, *Asarum Europæum*, are used as an acrid emetic, and the roots possess the same property in even a higher degree. In the form of powder it enters into the composition of cephalic snuffs. Their active principle is called *Asarin*. In Canada the *Asarum Canadense*, wild ginger or Canada snake root, is used as a spice; and the root of the *Aristolochia Serpentaria* or Virginia snake root, is now employed in medicine as a tonic diaphoretic. The latter was formerly considered to be an antidote to the poison of snakes. The juice of the *Aristolochia anguicida* mixed with the saliva, and put into the mouth of a serpent, is said to stupefy the creature, so that it may be handled with perfect safety. The flowers of some of the species from the tropical parts of America are very large and sometimes grotesque. The border of the calyx of the *Aristolochia cymbifera* resembles one of the lappets of a Norman woman's cap, and measures seven or eight inches in length; while the flowers of the *A. coraiflora* and *A. gigantea*, measuring fifteen to sixteen inches across, are large enough to form bonnets for the native children.

Arnica.—A genus of plants belonging to the nat. ord. *Compositæ* and sub-order *Corymbiferæ*. The species called leopard's bane, or mountain tobacco, *A. montana*, a native of the middle and north of Europe and the Alps, is an acrid stimulant. Every part of the plant contains a resin and a volatile oil, combined with an acrid bitter principle called *Arnicine*. It is used in Germany in cases of low fever and nervous diseases, but is not in very general use in this country. An overdose produces inflammation of the alimentary canal and stupor. Arnica is used in this country by the homœopathists for wounds and bruises.

Arnotto or **Annotto**.—A species of red dye formed of the pulp enveloping the seeds of *Bixa Orellana*, a plant belonging to the nat. ord. *Flacourtiaceæ*, and common in South America and East and West Indies. It has been occasionally employed by dyers to impart a deep orange colour to silk and cotton. The dye, however, is not durable, and the chief use of arnotto now is to give a colour to cheese. It is exclusively used in all large dairies in England, and in many of those on the continent. In Gloucestershire they allow an ounce of arnotto to a cwt. of cheese. In Cheshire eight dwts. are reckoned sufficient for a cheese of six lbs. When genuine it affects neither the taste nor smell of cheese. Taking the average of the years 1840 and 1841, there were entered at the customs 296,821 lbs. for home consumption.

Arracacha.—A genus of plants belonging to the nat. ord. *Umbelliferæ*. *A. esculenta* is a native of South America, and is very much cultivated in the neighbourhood of Santa Fé de Bogota and other parts of Columbia, where the root is used by the natives as much as potatoes or yams are elsewhere. The root is of the same nature as the potato, but is forked or divided into lobes, each of which is of the size of a large carrot. They are boiled like a potato, and have a flavour intermediate between the parsnip and chestnut.

Arragonite. *Prismatic Carbonate of Lime.*—A mineral substance consisting of carbonic acid and lime in crystals. These crystals have been found most abundantly in a ferruginous clay in Arragon, in Spain, hence the name. Arragonite is found in other places on the continent and in England.

Arrow-root.—The starch derived from the roots of various plants growing in India and South America is called *Arrow-root*, and has obtained its name from its having been considered an antidote to the poisoned arrows of the Indians. The best or West Indian arrow-root is obtained from the roots of the *Maranta arundinacea*, which is cultivated for the purpose. A very good kind, called East India arrow-root, is obtained from the roots of the *Curcuma angustifolia*, which is a native of the coast of Malabar, and yields such quantities as to be a considerable object of trade. The Tahitan arrow-root is procured from the root of the *Tacca pinnatifida*; the Portland arrow-root from the *Arum maculatum*. The arrow-root is procured from the grated root stock, washing it well so as to separate the cellular tissue and remove the juice contained in it, which is often acrid. The amount entered for home consumption in the United Kingdom, taking the average of the years 1840 and 1841, was 484,893 lbs. per annum. In 1852, 18,074 cwts. were returned for home consumption.

Arsenic.—A metal of a bluish-white colour, not unlike that of steel, and with a good deal of brilliancy. It is the softest of all the metallic bodies, and so brittle that it may be easily reduced to a fine powder by trituration in a mortar. Native arsenic is usually found in

veins accompanied by sulphur and sulphurets. It occurs massive, also in reticulated and stalactitic shapes, and of a curved lamellar composition exceedingly like the layers of an onion. When cold, arsenic has no sensible smell, but when heated, it exhales an odour of garlic. This is one of the readiest tests of the presence of arsenic. Arsenic is found pure, and combined with many other substances as cobalt, pyrites, nickle, silver, antimony, copper, lead, iron, &c. *Orpiment* is the yellow sulphuret of arsenic, and is made use of as the basis of the pigment called king's yellow. *Realgar* is the red sulphuret of arsenic. It is used in making fire-works. Metallic arsenic is not used in the arts, and in this state exerts no action upon the animal system. When oxydized, however, it becomes a virulent poison, and it is in this form only that we find it brought into commerce. It is then rendered, under judicious management, a valuable medicine, and is used for various purposes in the arts. It is principally imported from Saxony and Bohemia.

Artamus. *The Wood Swallow.*—A genus of birds belonging, according to some ornithologists, to the *Dentirostres*, and placed among the *Ampelidæ* or butcher birds, or near the *Laniidæ* or shrikes; according to others, belonging to the *Fissirostres*, following close to the *Hirundinidæ* or swallows. Several species are described, most of them natives of Australia. Their flight is like that of the swallow, sweeping over the plain with great rapidity, soaring aloft at one time, at another skimming over the surface of the country. They feed almost entirely on the wing, and live chiefly on insects, though some partially subsist on berries. They are migratory birds, but are remarkable for the peculiar habit they have of suspending themselves on the under side of a dead branch in perfect clusters, like a swarm of bees. The *A. sordidus* is the commonest species, and is fond of taking up its abode in the neighbourhood of man, incubating near houses, especially such as are surrounded by paddocks, and open pasture lands skirted by large trees. The *A. minor* is the most graceful of all the species, floating about in the air in the easiest and most elegant manner possible.

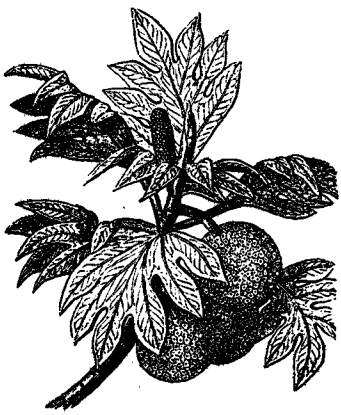
Artemia, *Artemis*, a proper name.—A genus of *Entomostraca*, belonging to the family *Branchipodidæ*. See PHYLLOPODA. The species of this genus are inhabitants of water highly charged with salt, and are small slender animals of an elegant form. One species, *A. salina*, is a native of England, and is found in considerable abundance in the salt pans at Lymington, where it is called the brine shrimp. It is exceedingly graceful in its movements; swims on its back, and gambols in the briny solution with great vivacity. Another species, *A. Oudneyi*, was found by Dr. Oudney in Fezzan, in some lakes highly charged with salt and saltpetre. Dr. Vogel informs us it is called by the natives Dûd. It is found in great abundance, and forms a much esteemed article of food, highly prized by the natives of that kingdom.

Artemisia.—A genus of plants belonging to the nat. ord. *Compositæ*, sub-order *Corymbiferæ*. The genus contains numerous species, almost all of which have a strong odour, and a very bitter taste. *A. Absinthium* is well known as *wormwood*. It is intensely bitter and tonic, and derives its name from being used to destroy worms in children. A good many other species, under the name of wormwood, are used for the same purpose; and several vermifuge drugs, known as semen cinæ, barbotine, &c., are prepared from them. *A. Abrotanum*, or southern wood, a species found cultivated in every cottage garden, is remarkable for its peculiar odoriferous qualities, and is used on the continent in the preparation of beer. It is found all over the south of Europe, from Portugal to the Dardanelles; and thence through Palestine, Persia, and the middle of Asia, into China. A bitter aromatic liqueur, called Crême d'Absinth, in request in France amongst those who indulge in the pleasures of the table, is distilled from one or two other species of Artemisia; and the substance called *Moxa*, which is used as a counter-irritant, and employed in the form of a cautery in cases of chronic rheumatism, &c., is procured from *A. Chinensis*, or *A. Moxa*. Some of the species have a strong odour of vinegar, and are used in the preparation of pickles and salads, and for medicating vinegar.

Articulata. *Articulated Animals.*—A division of the animal kingdom, the species of which are characterized by the body being composed of moveable pieces, jointed or *articulated* to each other. There are many classes and orders belonging to this division, varying considerably from each other in form and structure, but all agreeing in their nervous system. This consists of either a very small brain, and two nervous chords surrounding the œsophagus or gullet, and continued along the abdomen, but uniting here and there into knots, called ganglia—or of merely two ganglia, one in the head and the other in the thorax, and united by slender threads. Respiration is effected either by branchiæ, a species of gill; or by tracheæ, or air tubes. They have red blood. The division of articulated animals contains the ENTOZOA, or intestinal worms; the ANNELIDA, or annulose animals; the CRUSTACEA; the CIRRIPEDIA, or barnacles; the ROTIFERA, or wheel animalcules; the MYRIAPODA the INSECTA, or insects; and the ARACHNIDA, or spiders.

Artocarpaceæ (ἄρτος, bread; καρπός, fruit). *The Bread Fruit Tree tribe.*—With many botanists this forms only a sub-order of the nat. ord. *Urticaceæ*, or nettle family. It differs in one respect. The artocarps exude a milky acrid juice, the nettles a watery secretion. The genus *Artocarpus* contains the bread fruit tree of the South Sea Isles. This species, *A. incisa*, inhabits only

such places as are hot and damp. The tree is about the thickness of a man, and grows to the



Artocarpus incisa—The Bread Fruit Tree.

height of forty feet. The fruit is about the size of a melon, and the seeds are large nut-like bodies, which when roasted are said to be as good as the best chestnuts. The fleshy receptacle, however, is the valuable part of the fruit. It is as white as snow, and of the consistence of new bread, and when roasted becomes excellent food, tasting like wheaten bread mixed with Jerusalem artichokes. In 1793, Capt. Bligh succeeded in carrying some plants from the South Sea to the West Indies, and it was to obtain a further supply that the expedition was fitted out which ended in the "mutiny of the Bounty." A cloth is made from the fibres of the inner bark,—the wood is used for making boats and building houses,—the male catkins serve as tinder,—the leaves are used as towels, table cloths, and to wrap provisions in; and the juice for making bird-lime, and for filling up the cracks of their water vessels. The Indian jaca, or jack tree, *A. integrifolia*, yields a fruit somewhat similar, but not so good. The juice of these two species is acrid. That of the cow-tree of Demerara, the Palo de Vaca, or *Galactodendron* (*Brosimum*) *utile*, on the contrary is so bland, that it is used by the natives as a substitute for milk. The celebrated upas tree, *Antiaris toxicaria*, is another species of the family. Extraordinary fabulous tales used to be told about this tree, which is a native of the Island of Java, and was said to be so exceedingly poisonous, that no one could even approach it without certain death. The stem when wounded exudes a gum resin, which, when introduced into the animal economy, produces vomiting, purging, and finally death, with tetanic convulsions. The natives of Java and Borneo use it mixed up with the *Capsicum fruticosum*, and some other substances, to steep their arrows in. It is said to act more powerfully when it is dried on the arrows than when used moist. The *Cecropia peltata* is called the trumpet wood. Its stems are hollow, and they are used as wind instruments. The fibrous bark of the tree is used as cordage, and the light and porous wood is employed to produce fire by friction.

Artocarpus.—See ARTOCARPACEÆ.

Arum.—A genus of plants. See ARACEÆ.

Arundo. *The Reed.*—A genus of plants belonging to the grasses. The genus is much broken up by modern botanists. It used to contain the common reed of this country, *A. phragmites;* and the sea reed or marrun grass, *A. arenaria*, which is such a useful grass for binding the loose sands of the sea shore, and thus materially helping to reclaim large portions of sand from the sea, and convert them into useful pasture grounds. The former now forms the genus *Phragmites*, and the latter the genus *Ammophila*. *Arundo donax* is one of the largest of the grasses. It is a native of the south of Europe, and other parts of the world. The canes or stems are imported to us from Spain and Portugal for the use of weavers, and for making fishing rods, &c. A beautifully variegated sort is often seen cultivated in our gardens.

Asaphus.—A genus of fossil crustacea belonging to the *Trilobites*. The species appear to be numerous, and are most abundant in the lower palæozoic strata.

Asarum.—A genus of plants.—See ARISTOLOCHIACEÆ.

Asbestus.—A mineral substance. See AMIANTHUS.

Ascaris.—A genus of intestinal worms. See ENTOZOA.

Ascidia.—A genus of molluscous animals. See TUNICATA.

Ascidium (ἀσκίδιον, a small bag).—A name given to an anomalous form of petioles constituting a hollow receptacle which is called a pitcher, as in *Nepenthes*. See NEPENTHES.

Asclepiadaceæ.—A nat. ord. of dicotyledonous flowering plants. The species are very numerous, 910 having been described. They are chiefly shrubs, usually possessing a milky juice, and often twining. They inhabit for the most part warm and tropical regions, though there are many natives of northern latitudes also. In general they have acrid, purgative, emetic, and diaphoretic properties. The milky juice is usually bitter and acrid, but occasionally it is bland, and is used as milk, as in the case of *Gymnema lactiferum*, the cow plant of Ceylon, which the Cingalese use for this purpose. Many of the species of the genus *Asclepias* possess powerful medicinal properties. The roots of *A. curassavica*, or bastard ipecacuan of the West Indies, are emetic, and are frequently sent to England as ipecacuanha. The roots of *A. tuberosa*, or tuberous swallow-wort of North America, are

famed for their diaphoretic qualities, and are used in Virginia in inflammatory diseases. The sap of *A. Syriaca*, or Syrian swallow-wort, is recommended as an expectorant. It is white, and contains a considerable quantity of caoutchouc. The nectaries or leaflets of the crown act as fly traps. The seeds of this and some other species are covered with down, which is well adapted for stuffing mattresses and pillows. They are hence sometimes called wild cotton plants. A good many of them are cultivated in Europe for their beauty. Their flowers have curious horned processes added to the corolla. The species of the genus *Stapelia* are singular looking plants, forming at the Cape of Good Hope a stunted, deformed vegetation, in the form of leafless succulent plants, resembling some of the cactuses and euphorbias. The flowers are often very fetid, and are consequently called carrion flowers. The leaves of *Solenostemma argel* are used in Egypt to adulterate senna, and the fragrant roots of *Hemidesmus indicus* are used in Madras as a substitute for sarsaparilla, under the name of country sarza. The celebrated Hindoo medicine, mudar, used as a diaphoretic in India, is procured from the bark of the root of several species of *Calotropis*, especially *C. gigantea*. It contains a principle called mudarine, which gelatinizes upon being heated, and becomes fluid on cooling. Some of the species of the genus *Cynanchum* act as purgatives; the *C. monspeliacum* furnishing what is called the Montpellier scammony, and being used to adulterate the true scammony. Some of the genera furnish species which yield a dye said to be similar to indigo. The *Hoya carnosa* has a peculiar waxy-looking blossom, and is called the wax flower. The silk plant of Madeira, *Gomphocarpus fruticosus*, belongs to this family.

Asclepias.—Name derived from *Æsculapius*, the god of medicine. See ASCLEPIADACEÆ.

Ascomycetes (*ασκος*, a bag).—An order of *Fungi*, or mushrooms, producing the spores, often in sets of eight, in tubular sacs, which are called *Asci* or *Thecæ*. They are nearly related to the lichens. They differ considerably in external form, and are hence divided into several tribes. Some are flocculent in appearance, and either grow on dead animal substances, feathers, horn, &c., or on the leaves of trees or herbaceous plants. Others are of a fleshy consistence, some growing on the ground or on decaying vegetable substances in damp situations, assuming the form of pretty large cups, often raised on a stalk, such as the species of *Peziza*; others growing underground of a globular form, solid and fleshy within, such as the truffle *Tuber cibarius*.

Asellidæ.—A family of crustacea. See ISOPODA.

Asellus.—A genus of crustacea. See ISOPODA.

Asilidæ.—A tribe of insects belonging to the order *Diptera*. The species belonging to it are many, and it has been necessary to create a number of distinct genera. The genus *Asilus* is the type of the tribe, and several British species are well known. They are very strong, predaceous insects, living upon live flies, humble bees, and even insects, &c., which they chase and soon kill. Their flight is strong, and when on the wing they make a loud buzzing noise. They attack horses and cattle, and sometimes cause them great annoyance and irritation.

Asinus. *The Ass.*—A genus of animals. See EQUIDÆ.

Asiphonidæ (*a*, priv.; *σιφων*, siphon or tube).—See CONCHIFERA.

Aspergillum.—*The Watering-pot Shell.*—A genus of conchiferous or bivalve mollusca, belonging to the family *Gastrochænidæ*. The animal lives in a shelly tube, which is round, elongated, open above where the siphonal end is generally ornamented with a series of ruffles; but closed below with a convex disc, which is perforated with numerous small holes, and having a minute central fissure. The valves of the shell are very small, equilateral, and cemented to the lower end of the tube, the umbones only being visible externally.

Aspergillus.—A genus of fungi, belonging to the *Mucedines*, or what are commonly known as *Moulds*. One species of this genus is well known as producing the blue mould of cheese. This is the *A. glaucus*; which is not only common on cheese, lard, bread, &c., but what is curious, is also found in the lungs and air cavities of birds. It gives a value to cheese, and its colour is often imitated by fraudulent dealers by sticking brass pins into the cheese, the verdigris formed from the pins giving it the colour of mould.

Asphaltum. *Mineral Pitch.*—A variety of bitumen arising from the decomposition of vegetable matter. It is found in most parts of the world, and is the principal colouring matter of the dark indurated marl or shale found in coal districts. It occurs very frequently floating on the surface of springs. There is one such in the island of Zante, which was at work in the time of Herodotus, and continues so at the present time. A basin occurs in Trinidad, three miles in extent, and of unknown depth, full of this liquid mineral. Great quantities are found on the shores or floating on the surface of the Dead Sea. It is the produce also of the manufacture of coal gas, and has lately become of great use in paving, and making roads and footpaths.

Asphodeleæ. *The Asphodel tribe.* — See LILIACEÆ.

Aspidites.—A genus of fossil ferns, comprising a number of species having a general resemblance to the recent genus *Aspidium*.

Aspidium.—A recent genus of ferns. See ACROGENÆ.

Aspidophorus.—A genus of fishes. See COTTIDÆ.

Asplanchna.—A genus of minute animals belonging to the class *Rotatoria* or *Rotifera*. The species have no feet, intestine, or anus visible. They have from one to three eye-spots, and possess mandibles. The sexes are separate.

Asplenites.—A genus of fossil ferns, containing a number of species, bearing a general resemblance to the recent genus *Asplenium*. They are most of them found in the mines of Silesia.

Asplenium. *Spleen-Wort.*—A recent genus of ferns, with the fructifications or sori disposed in right lines along the under disc of the frond. A considerable number of species are described; several are natives of this country, and used formerly to be regarded as excellent remedies in cases of coughs, asthma, obstructions of the liver, &c.; as *A. Adiantum nigrum* or black spleen-wort; *A. ruta muraria*, wall rue; and *A. Trichomanes* or common spleen-wort. The *A. nidus* or bird's nest spleen-wort is a native of Java and the Society Islands. It grows on the tops of trees, the leaves coming out in a circle, and forming a kind of umbel, in the middle of which birds make their nests.

Astacus.—A genus of crustacea, containing the lobster, &c. See MACROURA.

Astarte (a proper name).—A genus of shells. See CRASSINIDÆ.

Astasiæa.—A family of microscopic animals belonging to the class *Infusoria*. Their body is of a spontaneously variable form, and they are insoluble in solution of caustic potash. There are several genera. The genus *Astasia* contains one species, *A. hæmatodes*, which is at first green, then becomes red, and so abundant as to colour the water of ponds blood-red. Another species, *A. nivalis*, is found in red snow, but would appear to be only an active form of *Protococcus nivalis*. The genus *Euglena* belongs to this family, according to many naturalists, but would in reality seem to be merely a form of an alga, and is therefore a vegetable and not an animal. The *E. viridis* is very common, and has been made the subject of experiments by M. Gros of Moscow, who declares that at one time it is a vegetable, and at another becomes an animal.

Aster (*ἀστηρ*, a star).—A genus of plants belonging to the nat. ord. *Compositæ*; and sub-order *Corymbiferæ*. A great number of species are described from all parts of the world, though about three-fifths of the number are from North America. Several are handsome showy plants, such as the *A. Chinensis*, or China aster, which was imported into France from China in the year 1728; the *A. serotinus*, or Michaelmas daisy, &c., and are much cultivated in gardens. By some botanists the China aster forms the type of a new genus called *Callistephus*.

Asteracanthus (*ἀστηρ*, a star; *ἀκανθα*, a spine).—A genus of fossil placoid fishes discovered in the lias and oolitic formations.

Asteriadæ.—A family of animals belonging to the class *Echinodermata*, and known by the name of star fishes or sea stars, from the star-like form which they all have more or less. They have a coriaceous skin, in which are implanted spines or tubercles. Their body is expanded into arms of the same structure as itself. The under surface of these arms is marked with gutters or grooves, radiating from the centre, and pierced with several rows of small holes, through which issue tentacula, with expanded tips capable of contracting and elongating themselves. By means of these filaments acting as suckers the animals are enabled to walk; their motion is, however, very slow. The animals belonging to this family vary much in form and structure. Most of the species have five rays or arms, but some have more, varying from eight to thirty. They have the power of reproducing these arms or portions of them, if they are accidentally broken off; and if an entire arm be torn off with a small portion of the body attached to it, other arms are reproduced, and a fresh perfect animal is formed. Their mouth is always placed in the inferior centre of the rays. They live chiefly on young shells, crustacea, and other marine animals. They are oviparous, and their spawn is said to be venomous to the touch, and poisonous to the animals which eat them. Their larvæ or young are different in appearance from the adult animal. They are ciliated, and move with great quickness by means of their vibratile cilia, and swim rapidly rotating round their axis. The species are numerous, and are arranged in a considerable number of distinct genera. In *Asterias* or the typical star fish, the rays or arms are five in number, and they much exceed in length the diameter of their disc. Several species are found on our coasts. In *Astropecten* the back of the rays or arms are thin and netted, and have numerous tubercles at the junction of each of the little bones, which are covered at their tips with many small moveable spines. The genera *Pentaceros* and *Goniaster* have the body or skeleton formed of large roundish tubercles, the skin between which is pierced with small holes, the first having a convex back and a triangular arm, the latter being flat above and beneath, with five broad, short rays edged with larger pieces. *Asterina* has the skeleton formed of compressed pieces, placed one over the other like the tiles of a house, and have always a thin margin. The species are generally flat and pentangular. Some are many rayed.

Asterias (*ἀστηρ*, a star). *Star Fish.*—See ASTERIADÆ.

Asterina.—See ASTERIADÆ.

Asterodermus (*ἀστηρ*, a star; *δερμα*, the skin).—A genus of fossil fishes belonging to the order *Chondropterygii* and family *Raiidæ*. Found at Solenhofen.

Asterodiscus.—A genus of existing ani-

mals belonging to the radiate *Polythalamia* or *Foraminifera*; a species of which is found at Suez and in St. Domingo.

Asterolepis (*αστηρ*, a star; *λεπος*, a scale). —A genus of fossil fishes described by Hugh Miller.

Asterophyllites (*αστηρ*, a star; *φυλλον*, a leaf).—A group of fossil plants distinguished by their having their leaves united in a great number of whirls and disposed in form of a star. It contains many species, found in the coal formations of Europe and America. They appear limited to that era, as no species have as yet been found in more recent strata. The *Annularia longifolia* is the most widely diffused species belonging to the group.

Astræa (*αστηρ*, a star).—A genus of zoophytes belonging to the division *Anthozoa* and order *Zoantha*. It belongs to the stony corals, and receives its name from the star-shaped discs which cover the upper surface. They are lamellar and sessile, and each disc is the seat of a polype resembling the actiniæ in general form, having a single row of numerous arms, with the mouth in the centre. A number of species are described inhabiting the warm regions of the globe. Some have the discs separate from each other, leaving interstices between them; others have the starry discs contiguous. The fossil species are equally numerous, occurring principally in the tertiary and jurassic formations.

Astragalus.—A genus of plants belonging to the nat. ord. *Leguminosæ*. Many species, about 300, have been described. They are herbaceous or shrubby plants, the greater number of which are found in the extra-tropical portions of the northern hemisphere; they are particularly abundant in Siberia. The *A. Creticus, verus*, and *gummifer*, and perhaps one or two others produce the gum called in commerce gum tragacanth. It is procured by making incisions, or it exudes naturally from cracks in the bark.

Astrocaryum.—A genus of palm trees—natives of tropical America. The species are of middling stature, and have the stems covered nearly all over with stiff and numerous prickles. The fruit resembles the cocoa nut; the flesh of the fruit of *A. murimuri*, from Para, resembles the melon in flavour and the musk in odour, and is considered a great delicacy by the Americans. The leaves make a good thatch. The wood of *A. Airi* is very hard, and the natives make good bows and arrows from it. The fibres of the leaves of *A. Tucuma* are much used for making fishing lines and nets.

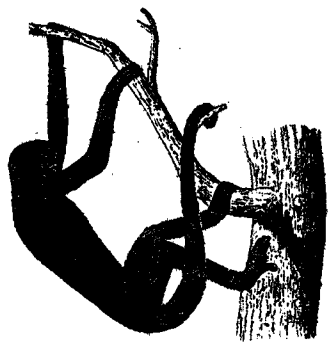
Astrocrinites.—A genus of fossil *Crinoidea* from the mountain limestone of Yorkshire.

Astropecten (*αστηρ*, a star; *pecten*, a comb). —A genus of star fishes. See ASTERIADÆ.

Astrophyton (*αστηρ*, a star; *φυτον*, a plant). —A genus of star fishes. See ASTERIADÆ.

Astur. *The Goshawk.*—A genus of raptorial birds. See ACCIPITRINÆ.

Ateles (*ατελης*, imperfect). *The Spider Monkey.*—A genus of quadrumanous animals belonging to the family *Cebidæ*, inhabiting South America. They are remarkable for their very long tails, strongly prehensile and callous at the extremity, their very slender limbs, and for their anterior hands having only four fingers. They are generally mild, timid, grave-looking creatures; and when nothing presses them, rather slothful and slow in their motions. On the ground they are awkward and embarrassed in their walk, but very agile and dexterous when



Ateles ater—Black Spider Monkey.

among the trees of their native forests. They live in troops on the lofty trees; and by means of their long prehensile tails which act as a fifth member, they swing themselves from one branch and from one tree to another with great facility. They are said even to cross rivers in this manner. Mounting to the top of the highest tree on the bank of the stream, they attach themselves to each other, in a chain, by their tails. This chain is allowed to swing to and fro till it has obtained sufficient momentum to enable the last on the chain to catch hold of a branch on the opposite side. This done, it ascends to the top of the tree, and the other end of the chain is then allowed to swing, and the whole troop are passed over. *A. Paniscus*, quata or coaita monkey, is very common in the woods of Surinam and Brazil; and is very intelligent, active, and gentle. It exhibits the most surprising agility in swinging from branch to branch, and from tree to tree. *A. Beelzebub* or marimonda is, on the contrary, very slothful—but of a gentle, timid, and melancholic temperament. It is a native of Spanish Guiana, where it is very common, and is eaten by the Indians. Several other species are described; some of them are very docile, and easily domesticated. Our illustration represents the black spider monkey, *A. ater*.

Ateuchus.—A genus of insects belonging to the order *Coleoptera* and family *Coprophagi*, or

dung-eating beetles. They enclose their eggs in little balls of dung the size of pills, and roll them backwards with their hind feet till they reach the hole which they had previously prepared for their reception. Two of the species of this genus were worshipped by the ancient Egyptians, and often form the subject of their hieroglyphics. Their effigy is represented in all their monuments; models of them were made of the most precious materials and formed into amulets, &c., to be suspended round the neck, and which were buried with the mummies. The insects themselves have been found in their coffins. The two species are *A.* (*Scarabæus*) *sacer* or sacred beetle, and *A.* (*Ægyptorum*, which has lately been described as a native of Sennaar, possessing more brilliant colours than the other.

Atherina (*ἀθήρ*, a spine).—A genus of fishes belonging to the order *Acanthopterygii*. They are very abundant in the Mediterranean, and form a considerable fishery there. They are salted and sold as sardines.

Atlanta.—A genus of gasteropodous mollusca, with a very thin, transparent, fragile shell. The animals swim on the surface of the ocean and are sometimes found in great abundance far from land. They swim with great rapidity.

Atropa.—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and containing several poisonous species. *A. Belladonna*, deadly nightshade or dwale, is a common plant in this country, and is one of our most active indigenous poisons. All parts of the plant are narcotic, and the berries, which are of a black shining colour like black cherries, are very attractive, often fatally so, to children. It owes its poisonous quality to the presence of an alkaloid called *Atropia*, which exists in the plant in combination with malic acid. Belladonna is much used in medicine to allay pain and spasmodic action, &c., to cause dilatation of the pupil, and as a prophylactic against scarlatina.—The mandrake, till lately, belonged to this genus also, and is known as the *A. Mandragora*—though now it is described as the *Mandragora officinalis*. It is a native of the south of Europe, and is very common in the Grecian islands. The root is poisonous, is large and fleshy, and is supposed to resemble somewhat the body of a man. Formerly many absurd and superstitious stories were believed of this plant. It was believed to be endowed with animal feelings, the roots were said to shrink when taken out of the earth, and it was accounted dangerous to disturb them. The mandrake was considered to possess wonderful virtues, and is the plant mentioned under that name in the Bible. The root will remain sound for fifty years.

Atta. *The Visiting-Ant.*—A genus of ants. See FORMICIDÆ.

Attelabidæ.—A tribe of insects belonging to the order *Coleoptera* and family *Curculionidæ*. The larvæ of these beetles live either in the stems of plants, or in the fruits, which serve them both as a shelter and as food. Others live in leaves in flowers, which they roll round them, and of which they only eat the parenchyma. They change their skin several times before they attain their full growth; having acquired which, they spin a cocoon of silk or tolerably solid resinous matter, and there undergo their transformations. The larvæ do great mischief to the plants upon which they live, but as beetles they are perfectly harmless.

Attus.—A genus of spiders. See ARANEIDÆ.

Atypus.—A genus of spiders—the species of which inhabit turfy declivities, where they form deep cylindrical excavations seven or eight inches long. In these they weave a kind of funnel of white silk of the same dimensions, and at the bottom of this cavity the cocoon in which their eggs are deposited is fixed by means of threads attached to each other.

Augite (*αὐγή*, brightness).—A mineral found in basalt, lavas, and other volcanic rocks, and called by Hauy, *Pyroxene*. Augite is composed of one equivalent of bisilicate of lime united with one equivalent of bisilicate of magnesia, one or other of which is sometimes removed and replaced by the protoxide of iron or manganese, forming several varieties, according as one or other is predominant. These minerals are nearly related in geological situation and in composition, with *Amphibole* or Hornblende. See HORNBLENDE.—Many mineralogists unite the two into one genus.

Aurantiaceæ.—A family of dicotyledonous plants; sometimes also called *Hesperideæ*. They are trees or shrubs. The leaves are dark green, glabrous, of a coriaceous texture, and dotted with numerous transparent points, caused by the presence of receptacles filled with a volatile oil which communicates the odour peculiar to the family. The species are numerous, the greater number originally natives of the tropical regions of Asia, though now cultivation has spread them over the larger portion of the globe. The flowers are usually odoriferous; the fruit has a more or less acid pulp, and the wood is generally compact and valuable. The genus *Citrus* contains the best known species of the family. The *Citrus Aurantium* is the common or sweet orange, of which there are about a dozen distinct and well known varieties. The St. Michael's orange is the variety best known in England. A single tree, it is said, will produce 26,000 good oranges. The *Citrus Bigaradea* or *vulgaris* is the bitter orange, or bigarade; of which, the Seville orange, well known in the form of marmalade, &c., is one of its varieties, no fewer than eight having been described. An essential oil, called neroli oil, is procured from its flowers. The *Citrus Bergamia* is the bergamot orange, from the flowers and rind of which

is obtained an essence of delicious quality, known by the name of *Bergamot*. 100 fruits are said to yield 2½ ounces. The *Citrus Limetta* is the lime—so much esteemed for flavouring punch, sherbet, and other beverages. The *Citrus decumana* is the shaddock, which is extensively cultivated in the West Indies, and is known in this country by the name of the forbidden fruit. The *Citrus Limonium* is the lemon, the juice of which forms such an excellent antiscorbutic, and is so much used for cooling drinks and effervescent draughts. A single tree will produce 8,000 lemons. The *Citrus medica* furnishes the citron, the rind of which is so well known as a delicate sweetmeat. This is perhaps the most beautiful species of the genus. A curious variety is cultivated in China and called the fingered citron, from its lobes all separating into fingers of different shapes and sizes. The fruits of several other genera belonging to the family are greatly esteemed in the countries which produce them. The *Wampa*, highly relished in China and the Indian Archipelago, is the fruit of *Cookea punctata*, and considered excellent. The *Œgle Marmelas* is used in medicine, and a perfume is prepared from the rind of the fruit which is itself delicious, and acts as a laxative.

Aurelia.—A name applied to that state of an insect between the caterpillar and the final transformation; and better known by the name of *Chrysalis* or *Pupa*. See CHRYSALIS. Also a genus of *Acalephæ*. See MEDUSA.

Auricula (*auricula*, a little ear).—A genus of shells. See AURICULIDÆ.

Auricularia.—The young state of the holothuria. See HOLOTHURIDÆ.

Auriculidæ.—A family of inoperculate pulmoniferous mollusca, belonging to the class *Gasteropoda*. The species live in salt marshes, damp hollows, and places overflowed by the sea. A considerable number of species (upwards of eighty) have been described, most of them natives of intertropical countries, though two or three are found in Great Britain. The species of the genus *Auricula* are met with on the roots of mangroves, in the brackish water swamps of tropical islands, as the Philippines, Celebes, Fijis, &c., and in Australia and Peru. The *Scarabus* inhabits moist spots, in woods near the sea, in the same countries as the last, and is wholly terrestrial, feeding on decayed vegetables. The *Conovulus* lives in salt marshes, and under stones on the sea shore of the West Indies. One or two species are European. The *Carychium* is one of the smallest of our English shell-bearing mollusca, and is found at the roots of grass in damp places, especially near the sea, in this country. A great many species of *Auriculidæ* are found fossil.

Automolite.—A mineral substance. See GAHNITE.

Autositarii (*αυτος*, one's self; *σιτος*, nourishment).—An order of monsters belonging to the class *Double Monsters*; or those where two individuals are joined equally developed. Some are united only in one region, as by the pelvis, or by the umbilicus (as the Siamese twins), and are separate inferiorly and superiorly. Others are separate till above the pelvic region, and only united in the cephalic portion of the body. A third set are double in the cephalic portion, and united in the inferior part of the body.

Autositi.—An order of *Single Monsters*, where the members, trunk, head, brain, or other viscera have undergone peculiar modifications, or deviations from the normal structure.

Avena. *The Oat Grass.*—A genus of the nat. ord. *Gramineæ* or grasses. It contains two or three species, which are of considerable importance to man. The common oat, *A. sativa*, is that which is most generally cultivated for use. Like most corn plants its native country is unknown; but most probably it is an inhabitant of some of the northern provinces of Asia, to which Europeans have little access. The Tartarian oat, *A. orientalis*, the naked oat, *A. nuda*, and the Chinese oat, *A. Chinensis*, are all cultivated. The last mentioned is said to be most productive, but difficult to harvest on account of the grains being loose in the husk and easily shaken out. As a food for horses the oat is everywhere used, and in many countries as Brittany, Scotland, Wales, and the northern parts of Europe, it is very much used as food for man also; and forms an important article of husbandry. A wild oat, called the animal oat by gardeners, the *A. sterilis* of botanists, is remarkable for the hygrometric properties of the seed. Two grains usually grow together, and they have a stout, bent, and twisted awn. When the oat is ripe it falls out of its glume, and in warm dry weather may be seen rolling and turning about on its long ungainly legs as they twist up, in consequence of their hygrometric quality. They turn and tumble about till their arms are so twisted that they can twist no further. They then remain quiet till the dews fall, or they are moistened by a shower, when they rapidly untwist and run about as if anxious to escape from the wet.

Aventurine.—A name given to a variety of quartz, coloured most frequently red or yellow, and in which fine points of mica, uniformly disseminated, cause it to reflect light brilliantly. There is an artificial preparation of coloured glass, manufactured at Venice, and called avanturine. This mineral derives its name from the resemblance it bears to this coloured compound.

Averrhoa (after *Averrhoes*, the celebrated commentator on Aristotle).—A genus of plants belonging to the nat. ord. *Oxalidaceæ*. There are two species, both of which are natives of India. The carambola, *A. Carambola*, is a small tree, the leaves of which possess a degree of irritability like that of the sensitive plant. It has a fleshy oval fruit, about the size of a goose's egg, which

is agreeably acid. The beimbing, *A. bilimbi*, has a fruit resembling a small cucumber, and is intensely acid. Its juice is found an excellent agent for removing iron moulds, or other spots from linen.

Aves. *Birds.*—The second class of vertebrated animals in the zoological arrangement. Birds may be characterized as warm-blooded, oviparous, vertebrated animals, covered with feathers, and mostly organized for flight. Their bones are destitute of marrow, being adapted instead for receiving from the lungs atmospheric air. They are divided into orders and families by the form of their limbs and beaks. A large number of birds, such as the raptorial and passerine tribes, build their nests on trees or in high places, and have their young hatched blind and nearly naked, so that it is necessary they should be fed by their parents, and kept for a time in the nest. Another group, such as the gallinaceous, wading, and aquatic birds, build their nests on the ground, have their young hatched with their eyes open, and covered with soft downy feathers, and most of them walk about to collect their own food as soon as they quit the shell. Fossil remains of birds are not so numerous as those of mammalia, still many have been found, and of late years several very interesting specimens have been discovered in New Zealand and neighbouring islands.

Avicula.—See AVICULIDÆ.

Aviculidæ.—A family of marine conchiferous mollusca belonging to the order *Pogonopoda* of Gray. They are called wingshells, from the extremities of the shell being produced, and in some assuming a wing-like appearance. Their external surface is generally foliaceous, and the internal of a brilliant pearly lustre. They are natives of tropical and temperate seas, none being found in northern latitudes, though fossil species occur in abundance. They are attached to rocks and stones by means of a byssus or beard which the animal projects through a notch in the shell. The genus *Avicula* has a very inequivalve shell; and though the recent species are not very numerous, about 300 have been found fossil, occurring in the lower silurian formation. The pearl oyster, *Meleagrina margaritifera*, so well known for its producing those beautiful gems called pearls, is a species of this family. It affords also the mother-of-pearl so much used for ornamental purposes. The pearl-fishing is of great importance in several parts of the world, particularly in Ceylon and the Persian Gulf; and the trade in the shells for mother-of-pearl between Liverpool and Manilla in the East, and Panama in the West, is very considerable. The imports during the three years ending with 1842 amounted at an average to about 950,000 lbs. a-year. In 1851 340 tons of these shells were brought from Panama by a single vessel. The hammer oyster, *Malleus vulgaris*, another species of the family, is remarkable for its form, which becomes extremely elongated with age, and has both ears long. The chief fossil genera of the family are *Posidonomya*, *Gervillia*, *Pterinea*, and *Inoceramus*.

Axis.—A genus of animals belonging to the deer family. See CERVINA.

Axolotes. *The Axolotl.*—A genus of animals belonging to the class *Amphibia*. See SIRENIDÆ.

Aythya.—A genus of birds. See ANATINÆ.

Azalia (ἀζαλέος, roasted). —A genus of plants. See ERICACEÆ.

B

Babingtonite.—A mineral occurring in small crystals of a greenish-black colour, associated with hornblende and felspar. It has been found at Arendal in Norway, in the Shetland Islands, and in the United States of America. It consists of silica, lime, oxides of iron and manganese, and a little oxide of titanium.

Bacillariæ.—A family of minute forms belonging to the class *Diatomaceæ*. In Ehrenberg's work they form a genus of infusorial animalcules, but they are now considered by most naturalists to be vegetables and not animals. The shields or coverings of these minute objects are siliceous, and their exuviæ are exceedingly numerous in a fossil state in the cretaceous, tertiary, and superficial deposits. The siliceous beds of Bohemia, which are fourteen feet in thickness, contain innumerable shields of the genus *Navicula*, and probably few of the superficial lacustrine deposits of Europe are wholly devoid of these exuviæ. Some of the genera are found recent living in fresh and sea water, in which there are decaying vegetable matters. The family contains several genera.

Bacterium.—A genus of confervoid algæ belonging to the tribe *Oscillatoriæ*, and consisting of extremely minute inflexible filaments showing more or less distinct appearances of being jointed. They are examples of lower organisms which, in the present state of our knowledge, it is very difficult to know whether to refer to the animal or vegetable kingdom. They possess a slow vacillating kind of movement, which has caused them to be considered by some naturalists as infusory animalcules. Dujardin places them in the genus *Vibrio*.

Bactris (βακτρον, a staff or cane).—A genus of palm trees, natives of the intertropical parts of South America, growing in marshy places, and on the banks of rivers. They are rather small trees, never exceeding twenty feet in height, and the stems are slender, about the thickness of a

man's thumb. They are of a very dense structure, and form very solid, hard, black canes, known in commerce as the canes of Tobago. The stems and leaf stalks are covered with long, sharp, flat spines, as black as ebony; and as these palms frequently grow in dense patches, they thus form impassable thickets. *B. acanthocarpæ*, a native of the forests about Bahia, yields an extremely tough thread, from which the natives manufacture strong nets. The fruits of two or three species are made by the inhabitants of the places where they grow, into a sweet sort of wine.

Baculites (*Baculus*, a little staff).—A genus of fossil cephalopodous mollusca. See AMMONITIDÆ.

Bairdia.—A genus of entomostracous crustacea belonging to the family *Cyprididæ*. Several species inhabit the fresh water ponds of Great Britain, and a considerable number are found fossil in the chalk formation.

Balæna. *The Whalebone Whale.*—A genus of cetaceous animals. See BALÆNIDÆ.

Balænidæ.—A family of animals belonging to the class *Mammalia* and order *Cete* or *Cetacea*. They are marine, viviparous, suckle their young as other mammalia, respire by lungs, and have distinct separate blow holes; they have warm blood, and have no teeth, but in their place have plates of *baleen* or whalebone attached to the upper jaw. This family contains those whales commonly known by the name of whalebone whales, and which are of immense size. The whale is the king and the ruler of the seas, as its etymology indicates, for we are told the name balæna is derived from the Phœnician word *Baalman*, which means the *king of fishes*. It reigns as a sovereign over the innumerable tribes which nature has formed in the empire of the mighty deep, and sailing in majesty on its surface, it imprints upon all the utmost respect and fear for its immense size and amazing power. The strongest tyrants of the liquid element fly from it as soon as it makes its appearance, and the ocean itself seems to groan under the weight of its body. The head of the whale is of great size, being a third and sometimes even half of the whole body, and the upper jaw is furnished with plates of a horny structure, arranged transversely in several rows, thin, of a triangular shape, and having their edges armed with long thread-like processes, which hang down loose in the mouth. These plates are from eight to ten feet long, and number about 300 on each side. This substance, called *baleen* or *whalebone*, forms a valuable article of commerce, and is known in the price currents by the name of *whale-fin*. This sometimes sells in the market from £200 to £300 per ton. The nostrils are situated on the upper part of the head, and are called spiracles, blow holes, or blowers. By a peculiar apparatus the water which the whale takes into its mouth can be thrown up through these nostrils to a considerable height. There are not many species—some have no dorsal fin, and the belly is smooth. These form the genus *Balæna*. Others have the dorsal fin distinct, and have the belly plaited. These constitute the genera *Megaptera* and *Balænoptera*. The Greenland whale, *Balæna Mysticetus*, is one of the best known species. It is a native of the northern seas principally, and has long been pursued by man for its oil and whalebone. The Greenland whale is from fifty to sixty feet long, and about thirty or forty feet in circumference. The head is about a third of the entire length, and when the mouth is open it presents a cavity capable of containing a merchant ship's jolly boat! One whale occasionally yields more than twenty tuns of pure oil, which is obtained from the thick layer of fat or blubber lying sometimes several feet in thickness under the skin. The fishery of this whale is a very important one to this country, and employs many ships yearly. It has fallen off, however, very much of late years. In 1820, 142 ships were fitted out in Great Britain for the northern whale fishery. In 1824 the number was 112. In 1827 the number fell to 88; and in that year 1,155 whales were captured, which yielded 13,179 tuns of oil and 732 tons of whalebone. In 1832 the number was still smaller; 81 ships were sent out, which brought home 12,610 tuns of oil and 676 tons of whalebone, of the estimated value, in all, of £336,700. Since that time the number of ships employed in this fishery has varied considerably. In 1850 46 ships were sent out; in 1851, 47; and in 1852 they amounted to 40; but in 1854 only 31 were employed. The gullet of the whales of this family is so narrow that it can scarce allow the passage of a man's fist. The food of the Greenland whale consists chiefly of small marine animals, as crustacea, mollusca, medusæ, &c. The female has rarely more than one young one at a time, and she exhibits a great degree of natural affection. To the Greenlander and Esquimaux this species is all in all. They eat the fat and flesh with indescribable relish. The membranes of the abdomen serve them as clothing, and the thin transparent peritoneum serves as glass for the windows of their huts. The bones are made into props for their tents, or assist in the forma-

Balæna Mysticetus—Greenland Whale.

tion of their boats, and supply them with harpoons and spears for the capture of the seal and greater sea birds. The sinews divided into filaments are used as threads for sewing their dress, and the threads of the whalebone form their best lines for fishing. The species of the genus *Megaptera* are called hump-backed whales. Four species are described. Those belonging to the genus *Balænoptera* are known by the name of fin-backed whales or finners. *B. antiquorum*, northern rorqual or razor-back, is the most remarkable species, and perhaps the longest animal in creation. It is of common occurrence in the North Sea, and is sometimes thrown ashore or stranded on the coasts of Britain. It attains the length of 100 feet, but the body is not so thick as the Greenland whale, neither is it by any means such a valuable species for its oil and whalebone. It is less quiet and tranquil in its movements, and when wounded becomes quite furious, rendering an approach to it dangerous. Its flight, when struck by the harpoon, is exceedingly rapid, and is so long sustained that it is difficult to tire it out. For these reasons it is not much sought after by the whale fishers. The skeleton of an individual of this species, seventy-four and a-half feet long, is now in the British Museum. Several species of balæna and balænoptera have been found fossil in the tertiary formations of Lombardy, Paris, and England.

Balænoptera (*Balæna*, a whale; πτερον, a wing).—A genus of cetaceous animals. See BALÆNIDÆ.

Balanidæ (βαλανος, an acorn). *Sessile Cirripedes*, or *Sea-acorn shells*.—A family of crustacea belonging to the order *Cirripedia*. They are characterized by their being fixed to submarine bodies without the intervention of a peduncle. The body of the animal is enclosed in a cylindrical or bell-shaped tube open at the top, formed of several valves united together side by side by a dentated suture, and covered by what is called an operculum, which consists generally of four valves nearly equal sized and sunk into a flexible skin, allowing them a considerable degree of motion. The base by which they are fixed is a shelly plate. The species are numerous and most widely diffused, taking possession of rocks, ships, timber floating or at rest, shells of crustacea and mollusca, &c., &c. Some of them are of considerable size, and one species of the genus balanus, *B. psittaceus*, found on the coast of Chili growing to the size of five or six inches, forms a very common and highly esteemed food for the natives, who call it *pico*. The flesh is said to equal in richness and delicacy that of the crab. Another species, *B. tintinnabulum*, is equally prized by the Chinese, the flesh of which is said to resemble the lobster. Some of the species, as in *Acasta*, are found attached to sponge, while others, as in *Pyrgoma*, are imbedded in corals. The species of the genus *Coronula* and *Tubicinella* attach themselves to the bodies of whales, and as they grow their shells are enlarged by the addition of new matter to the base of the valves, and they gradually raise themselves out of the substance of the skin in which they are immersed.

Balaninus.—A genus of coleopterous insects belonging to the family *Curculionidæ*. The species of this genus are destructive to the kernels of some kinds of fruit. *B. nucum*, the nut weevil, deposits its eggs in the filbert and common nut, having bored a hole for that purpose in the nut when it is young and tender. The larvæ feed upon the kernel, and at the proper time gnaw a hole in the nut and make their escape into the ground, where they burrow and remain till they assume the pupa state, from which in the following summer the perfect insect comes forth. *B. glandium*, another species, attacks the acorn in the same manner as the previously mentioned species does the nut. The perfect insects or beetles are small, and possess a long slender rostrum or snout, which is furnished at the tip with an apparatus fitted for boring the hole in the nut, into which it deposits its eggs.

Balanites.—A genus of fossil cirripedia, closely allied to the genus *Balanus*. Many species are described, chiefly from the upper beds of the crag formation.

Balanophoraceæ.—A family of plants belonging to the sub-class *Rhizantheæ*. They are leafless, scaly, parasitic plants, having more the appearance of fungi than flowering plants. They are succulent in texture, dingy in colour, and often spring from a brown and shapeless root stock. The known species are, with one exception, natives of tropical climates; and several have had a reputation as styptics or astringents. *Cynomorium coccineum*, commonly known as the *Fungus melitensis*, grows in Malta, and was long celebrated for arresting hæmorrhage. As a remedy in dysentery it was also held in high repute, and the knights of Malta set such a value upon it that they guarded it with extreme caution, gathered it with great care, and distributed it amongst the various hospitals on the island. Various species of *Helosis* have had a similar reputation, and the species of *Sarcophyte* are remarkable for their exceedingly bad odour.

Balanus.—*The Acorn Shell.* See BALANIDÆ.

Balearica. *The Balearic Crane.*—See ARDEIDÆ.

Balistes. *File Fish.*—See BALISTIDÆ.

Balistidæ (*Balistes*, a battering ram, or *Balistra*, the Italian word for a cross-bow). *File Fishes.*—A family of fishes belonging to the order *Plectognathi*. They are characterized by having a conical compressed body, jaws armed with one or two rows of small distinct teeth, and skin covered on the surface with scaly plates, surmounted with spines, tubercles, &c. The species are found chiefly in the intertropical seas. They live by preying upon mollusca and polyps.

and are observed to frequent rocky parts of the sea, which abound in their peculiar food. Their skin is adapted for this sort of habitat, as from its being covered with scales the fish do not fear coming into contact with the asperities of the rocks. The genus *Balistes*, or true file fish, is covered with tubercular scales, and the species appear to prefer the coral banks existing at moderate depths. They feed upon the young polyps of the madrepores, and this it is said renders their flesh unwholesome and even poisonous. They are mostly natives of the Indian seas and Pacific Ocean, though one species, *B. capriscus*, is found in the Mediterranean. It has three rays to the dorsal fin, and these are so arranged that if we press upon the posterior ray the others fall down immediately, as a cross-bow is let off by pulling the trigger. The fish can elevate them again at pleasure. Their colours are brilliant. The *Monacanthus* or unicorn file fish, has the skin covered with small spiny scales. The species appear to live at greater depths, and prefer parts of the sea less rocky, as their covering is not so hard as that of the *Balistes*. They are natives of the coasts of America, and live chiefly on crustaceous or testaceous marine animals. *M. monoceros* has the power of distending its abdomen at pleasure. It grows to the length of more than two feet. The *Triacanthus* or three-spined file fish, has a nacreous-looking skin covered with small scales running along a continued lateral line. The species are natives of the Indian and neighbouring seas.

Balsameæ. *The Liquid-ambar family.*—A sub-order of the large nat. order of plants called *Amentaceæ*, or the catkin-bearing family. It is the same as has been called *Altingiaceæ* by Lindley. There is only one genus, *Liquidambar*, which contains several species of lofty trees abounding in balsamic juice, and natives of tropical and warm regions. The balsamic resinous substance called liquid storax, which contains benzoic acid, and is so highly prized by the inhabitants of the East, is the produce of different species. *Liquidambar styraciflua*, *orientale*, and *Altingia*, are the chief sources from which it is procured.

Balsamina.—See BALSAMINACEÆ.

Balsaminaceæ. *The Balsam family.*—A family of plants belonging to the class dicotyledones. They are succulent, herbaceous plants, inhabiting chiefly the East Indies. The genera are few, and the species not very numerous. The *Impatiens* is remarkable for the force with which the seed vessel opens when ripe, the valves contracting, scattering the seed, and then curling inwards in a peculiar manner. The species of *Balsamina* are showy, handsome flowering plants, and are common ornaments of the greenhouse and garden. They are natives of the hot, damp, shady woods of Sylhet. *B. hortensis* is one of those flowers which, with a great disposition to become double, have the power of continuing to produce double flowers when renewed from seeds.

Balsamodendron (*βαλσαμος*, balsam ; *δενδρον*, a tree).—A genus of balsamiferous plants. See AMYRIDACEÆ.

Bambusa. *The Bamboo.*—A genus of dicotyledonous plants belonging to the nat. ord. *Gramineæ* or grasses. A number of species are known, all gigantic, tree-like, branching grasses, natives of India, the Isles of Sunda, and tropical America. The stems are hollow, jointed, hard externally, and coated with flint. The bamboo is one of the most valuable and useful plants which the Author of nature has bestowed on the natives of the countries where it grows. Wherever strength and elasticity are required in combination with lightness, there the bamboo is available. Houses are made and roofed with them, and all sorts of carpentry work are prepared from their stems. Cut into lengths, and the partitions at the joints knocked out, they form durable water pipes, or if the partition is left, excellent buckets are made for holding water. Masts of vessels, lance shafts, bows and arrows, with the quiver for receiving them, walking sticks, and smoking pipes, are readily prepared, and by notching their sides the Malays make wonderfully light scaling ladders, easily conveyed where heavier machines could not be transported. A grove of these gigantic grasses, when covered with spines, as several of the species are, such as *B. spinosa*, form stockades impenetrable without the aid of artillery. The young shoots, as they spring from the earth, make a tender and good esculent vegetable, and they are also used as a pickle. Most of the paper manufactured in China is made from the leaves bruised and crushed in water, and of the fibres baskets are made, and a durable material prepared for weaving into mats, window blinds, and even the sails of boats. It would be difficult to enumerate the various purposes to which the bamboo is applied. *Bambusa arundinacea* is perhaps the most common species. It sometimes covers immense spaces forming a dense jungle, and rising occasionally to the height of forty or fifty feet. It is at once majestic and elegant, and impresses upon the traveller the peculiar aspect of a tropical region. In the joints of the stems an opaque white substance, becoming opaline when wetted and composed of silica, is found, called *Tabasheer*. The seeds are sometimes used instead of rice, and a tolerably good bread is made of them. It grows very rapidly, but does not bear fruit or grain till it is twenty-five years old.

Banksia.—A genus of dicotyledonous plants belonging to the nat. order *Proteaceæ*, and named after Sir Joseph Banks. They are trees and shrubs, all natives of Australia, and handsome showy plants. Several species have been described, none of them of much use as timber, although they make good firewood. They are

called honeysuckle trees by the colonists, and are considered in New South Wales as evidences of bad land. They rise to an elevation of from thirty to fifty feet in height. An Abyssinian tree has been described by Bruce and also named after Sir Joseph Banks. The cusso, as it is called by the natives, *Banksia Abyssinica* of Bruce, is a different plant from any of the above-mentioned genus. See BRAYERA. It reaches about twenty feet high, a beautiful and useful tree, with the flowers growing in clusters like bunches of grapes. The trunk of the tree on the upper part is encircled with rings composed of small filaments of the consistence of horse hair, and fourteen to sixteen in number. It is always planted near the churches for the use of the natives of the town or village. These people seem to be much infested with *Ascarides* or intestinal worms, and a handful of flowers of the cusso mixed in two quarts of their country beer and steeped all night, is an effectual cure for the complaint.

Barbus.—See CYPRINIDÆ.

Barita.—A genus of birds belonging to the order *Passeres*, tribe *Conirostres*, and family *Corvidæ*. Several species belonging to this genus have been described, but differing so much one from another in important characters that several genera have been formed of them. One of the most particular species is the piping crow, *Barita tibicen*, which has been lately designated by Mr. G. R. Gray, *Gymnorrhina tibicen*. This bird is of a very dark plumage, most of the body being black except the hinder part of the neck, the top of the back, and the base of the wing coverts, which are white tinged with grayish-blue. It is very common in New South Wales, and is not unfrequently brought alive to this country. It is extremely docile in captivity, and can be taught to whistle airs with great correctness and sweetness. It is also a skilful mimic, imitating the clucking of a hen, the crowing of a cock, &c., with the utmost perfection.

Barosma.—A genus of plants. See DIOSMEÆ.

Bartramia.—A genus of operculated acrocarpous mosses. They are cæspitose in habit, growing in tufts, and vary much in size. Several well-known British species belong to the genus.

Barwood.—A red dyewood brought from Africa, particularly from Angola and the river Gaboon. The dark red colour which is commonly seen upon British bandana handkerchiefs is for the most part produced by the colouring matter of barwood saddened by sulphate of iron.

Barytes (βαρυς, heavy). *Heavy Earth.*—An earthy mineral composed of one atom of oxygen and one of barium. This oxide of barium is found in the earth in combination with acids, principally the sulphuric and carbonic. The native sulphate of barytes is known by the name of heavy spar and is much used in the arts. It is mixed with white lead and used for some kinds of painting, as it seems to prevent the paint being tarnished by sulphuretted hydrogen. A variety called Bologna spar is highly phosphorescent after being calcined. Native carbonate of barytes or witherite is found chiefly at Alston Moor in Cumberland, but occurs also in Lancashire and Styria. It is a poisonous mineral, and is used for killing rats. It is also employed in pyrotechny, and as a water colour. There are several varieties of these mineral substances.

Basalt.—A black hard rock, very tenacious, and consequently very difficult to break. It is composed of augite, felspar, and oxide of iron. According to modern geologists basalt owes its origin to the action of fire. Its formation has given rise to keen and bitter discussions between the Neptunians and Vulcanians, the former asserting it to be a deposit from water, the latter maintaining it to be the produce of volcanoes. It is a rock of very extensive occurrence on the surface of the earth, and is frequently observed in the vicinity of volcanoes both extinct and active. It is found, however, in immense beds, where no traces of any craters are visible, such as in the Deccan in India, where a space of many thousand square miles is wholly composed of it. Basalt frequently exists in columns, and the popular idea of this rock is, that it occurs so always. The best and most striking instances of this columnar arrangement may be seen in the Island of Staffa in Scotland, and at the

Fingal's Cave, Staffa.

Giant's Causeway in Ireland. Sometimes basaltic rocks show a globular structure, and at others an amygdaloidal form, containing agates, onyxes, and other minerals imbedded in them.

Basella.—A genus of dicotyledonous plants belonging to the family *Chenopodiaceæ*. The species are natives of India, and from the berries of *B. rubra* or Malabar nightshade, a beautiful colour is drawn, which is said to be used for staining calicoes in India.

Basidiospores.—The name applied to the spores or seeds which grow in groups of fours on the hymenium or under surface of many fungi, the term *basidium* being applied to the four-branched cell upon which they are attached.

Basiliscus (*βασιλίσκος*, a little king).—A genus of reptiles belonging to the family *Iguanidæ*. The animals belonging to this genus are remarkable for having a membranous bag of a triangular shape rising vertically above the occiput, which they can fill with air at pleasure; and an elevated dentated crest running along the back, capable of being raised or depressed at will. The hind legs are long, the fingers slender, and the tail compressed and of great length. The basilisks are natives of hot climates, living on the banks of rivers or fresh water ponds, and are partially aquatic in their habits. The structure of their body, mentioned above, adapts them for swimming and supporting themselves in the water despite the absence of web feet; while the long toes enable them both to climb trees, and crawl along their branches. *B. mitratus*, or hooded basilisk—the body seven or eight inches long, and the tail nineteen or twenty—inhabits Guiana, and the tropical parts of South America, and lives on seeds and insects. *B. Amboinensis*, or crested basilisk, upwards of three feet in length, is a native of Amboyna and islands of the Indian Archipelago. It loves to bask on the branches of trees overhanging the water, and at the least sign of danger it drops into the stream and conceals itself beneath some rock or stone. It is easily taken there, being a stupid animal, and it is sought after for the sake of its flesh, which is white and delicate as that of a chicken. The female is said to deposit her eggs in the sand, and leave them there to be hatched by the heat of the sun. It is to the resemblance of these animals to the figures of the basilisk of the ancients that Linnæus gave the name to this genus—one which is as distinguished for its harmless as the other was for its venomous qualities.

Basilosaurus.—See ZEUGLODON.

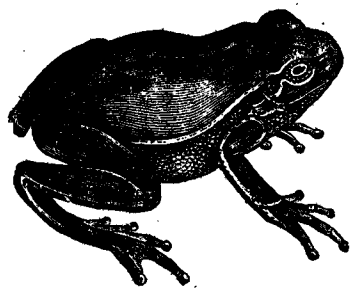
Bassia.—A genus of plants belonging to the nat. ord. *Sapotaceæ*. The genus consists of lactescent trees indigenous to tropical India and Africa. From the seeds of *B. longifolia* or Indian oil tree, a thick oil is expressed which the Hindoos use for lighting their lamps, for soap, and for cooking. The flowers which fall spontaneously from the trees are carefully collected and eaten when roasted. The milky juice from the bark is considered a good remedy in diseases of the skin. The wood is as hard and incorruptible as the famous Teak. The seeds of *B. butyracea*, or Indian butter tree, contain a substance which in the fresh state resembles butter, but which hardens by degrees and becomes like suet. This is considered by the Hindoos as a specific against rheumatism and contractions of the limbs. It is also much esteemed by the natives of rank as an unction for anointing the body. The timber is very light and of little or no value. *B. Parkii* is a native of Africa, and called after the traveller Park. This is the shea tree or African butter plant, which was described by Park as of so much value to the natives of Bambarra, and which might be valuable if transported to the West Indies or Bengal. The butter prepared from the seeds of this plant is said by Park to be whiter, firmer, and of a richer flavour than the best butter from the cow! The growth and preparation of this commodity constitutes a main article of the inland commerce of the natives.

Batatas.—A genus of plants belonging to the nat. ord. *Convolvulaceæ*. The generic name is the Malayan word for the sweet potato, which is the type of the genus. *Batatas edulis* (*Convolvulus Batatas* of older botanists), the sweet potato, is a well-known plant which, originally a native of the Malayan peninsula, is now cultivated in most of the warmer parts of the world. The roots are of considerable size, and when boiled or roasted yield a sweet wholesome mealy food. It is much used in the East, and before the potato was generally cultivated, was much esteemed in the south of Europe. It is still partially cultivated in Spain and the south of France, whence its roots are sent to the markets of Madrid and Paris, where they are considered a delicacy.

Bathyergus (*βαθυεργυν*, to work deeply in the earth.) *The Cape Mole-rat.*—A genus of animals belonging to the order *Rodentia* or *Glires*, and natives of the Cape of Good Hope. *B. maritimus*—the "zand moll" or sand mole of the Dutch, is about the size of a rabbit, with short legs and a large head, and lives near the sea shore, burrowing under ground and throwing up hillocks, which renders travelling on horseback dangerous—the horses sinking through the ground up to the shoulders. *B. Capensis*, or Cape mole-rat, is smaller and is very common in gardens at the Cape, where it is called "bless moll" by the inhabitants.

Batrachia (*βατραχος*, a frog). *The Frog family.*—An order of animals belonging to the class *Amphibia*. Cuvier arranges them under the class *Reptilia*. They differ from reptiles, however, in being destitute of scales, their toes being without true claws, and in having two occipital condyles. They have no ribs, or only the rudiments of them, but have feet. The male has no external organs distinctive of sex. The females are oviparous,—a few being ovoviviparous. The eggs are laid generally in the water, and are fecundated after they are deposited. They undergo a distinct transformation; the young animals, which are called "tadpoles," being of a fish-like form, having no legs, and breathing by external gills like fishes. These gills fall off when the limbs become developed; and the animal arrives at mature form. They then breathe by means of cellular lungs. The order *Batrachia* is divided into two sub-orders. The first, the *Salientia* or *Anoura*, leaping or tail-less batrachians, have the body short, depressed, and without any tail. Their limbs are

very unequal in length and strength, the hinder pair being much the longest. Their head is large and flat, and the mouth very large, and without teeth in the lower jaw. These tail-less batrachians consist of the frogs, toads, &c. The second sub-order, the *Gradientia* or *Urodeles*, the walking or tailed batrachians, contains those species which have the body elongate, tapering and long-tailed. Their limbs are weak, small, and equal in length. The head is flattened, and they have teeth in both jaws. These tailed batrachians consist of the salamanders and tritons, &c. Of the frogs *Ranidæ*, the common frog—*Rana temporaria* is the only species indigenous to the British Isles. The muscles of the legs are very powerful, and by their means the frog is able to leap twenty times its own height, and traverse at a single bound a space more than fifty times the length of its own body. The disposition of the muscles of the thigh and leg, in these creatures, presents indeed a great analogy with the muscular arrangement of these parts in a man. If we watch the horizontal motions of a frog in the water as it swims, we cannot fail to be struck with the great similarity of the movements of its lower extremities to those of a man in the same situation. They are carnivorous in the adult state, subsisting on insects, annelides, and small molluscs; but the tadpoles are vegetable feeders. The tongue in the adult is peculiarly adapted for securing its prey. It is differently formed in these animals from what it is in all the other vertebrata. It has its attachment or root placed rather in the fore than in the hinder part of the mouth, and when at rest has the free extremity turned backwards as if the animal were swallowing it. It can throw it out with considerable force, and it does so with such amazing celerity, that the eye can hardly follow its motion. The skin of frogs is naked, and has the power of acting upon the air in such a manner as to fulfil, in a great degree, the functions of the lungs, and thus enables the animal to remain a long time under water or buried in the mud below it. The edible frog, *Rana esculenta*, is a native of France, Italy, Germany, &c., and is highly prized as a delicate article of food in France. It is rather longer than the common frog, and is very voracious, occasionally seizing on young birds, mice, &c., and swallowing them whole. The male of this species during the breeding season, projects from the commissure of the mouth two globular bladders, into which the air is introduced, and the throat becomes swelled. It then croaks so loud as to be heard at a great distance. The bull frog, *Rana pipiens*, is the largest species of the genus, and is a native of North America. Its voice resembles the distant lowing of a bull — hence its English name. They are found at the mouths of springs, and from being thought to keep the water clear, they are rather protected, though they often swallow young goslings and ducklings entire. The tree frog, *Hyla arborea*, is the most beautiful of all the European species. It is distinguished by



Hyla arborea.

having the ends of the toes dilated into small pads, which enable it to attach itself to, and walk with its body suspended from, the under side of smooth bodies, such as the under-surfaces of leaves. It has the faculty of changing the colour of its skin, which, no doubt, enables it to elude the pursuit of its enemies. It is the only species of the genus *Hyla* found in Europe—several others being natives of tropical America, of Asia, and Polynesia, and a few of Africa. It lives on trees in summer, and feeds upon insects; but, at the approach of winter, betakes itself to the water, where it submerges itself in the soft mud and remains in a state of torpidity till the spring. A considerable number of species belonging to the *Ranidæ* are found in various parts of the world; upwards of 120 species having been described. Among the toads, *Bufonidæ*, which are distinguished from the *frogs* by both jaws being destitute of teeth, and having a warty skin—the common toad, *Bufo vulgaris*, is the most familiar. It has a thick squat body, much swollen, and covered with warts or tubercles. It is very common in gardens, woods, and fields, and frequently makes its way into cellars and such like obscure places. It is, for the most part, a nocturnal animal; coming out at night to search for its food, which consists chiefly of insects. Like the frog, it deposits its spawn in the water; and the tadpoles undergo the same series of transformations as they do. The toad absorbs a great deal of moisture through the skin, and can thus support a long abstinence from food and air. The stories are numerous of their having been found in blocks of stone and trunks of trees, alive; in which places they must have remained for hundreds of years: but these stories must all be taken *cum grano salis!* Toads cast their skin at intervals. The structure of the tongue is the same as in frogs; and it is wonderful to see the extreme rapidity with which they launch it forth and draw it back again, when they seize their prey. They are popularly thought to be venomous; and though the general

belief in this respect is very much exaggerated, yet, according to recent researches, they do possess an acrid humour in follicles distributed over the skin of the head and shoulders, and generally over the body. This, when placed on the tongue, is acrid to the taste like the extract of aconite; and appears to have a peculiar effect upon a dog, when it attempts to lay hold of a toad with its mouth. Only two species of toad are natives of England; but between forty and fifty have been described from other parts of the world—the greater proportion being from America. The Surinam toad, *Pipa Surinamensis*, resembles the common toad somewhat, but has no tongue. The head is large and triangular, the body is horizontally flattened, and the skin of the back granulated. The manner in which the young are hatched, in this animal, is very curious. The female deposits her spawn in the water; immediately after which, the male collects the ova together, and places them on the flattened back of the female. She then returns to the water with her load, when the skin of the back swells, so as to form a number of cells, into which the ova are pressed, after impregnation. These cells close over them, and retain them in that situation till they are hatched; and during the whole period, they are undergoing their transformations. The Surinam toad is found inhabiting the obscure corners of houses in Cayenne and Surinam, and has a repulsive and hideous appearance. Amongst the salamanders, *Salamandridæ*, some are terrestrial, and others aquatic. The terrestrial salamander, *Salamandra maculosa*, inhabits central Europe and the mountainous parts of the south of Europe, living in cool and moist places, and feeding upon insects, worms, and molluscous animals. The young at first inhabit the water, where they undergo a series of transformations; and it is not until they arrive at the mature state that they become fit for living on land. The colour of the salamander is black with yellow spots; the tail is cylindrical; and the body is extensively covered with warty glands, which secrete a milky fluid of a glutinous nature. This fluid appears to be poisonous to some of the lower animals, and has no doubt given origin to the numerous fables of their extremely venomous properties, and the power they possessed of resisting fire, and even of extinguishing flames. Its bite was considered fatal, and it was believed to poison everything it touched, and that whenever it saw the fire it was said to charge it as an enemy which it knew how to conquer. The aquatic salamander, great water newt or eft, *Triton cristatus*, is distributed over the whole of Europe, and is found in Western and Northern Asia. The ponds and ditches of this country abound with it, and most voracious and destructive it proves to the tadpole of the common frog, insects, and mollusca. The female deposits her eggs in the hollow of a turned up leaf of some aquatic plant, where they remain for a short time, and then commence their tadpole state. A series of metamorphoses takes place before the animal arrives at its perfect state. The power of reproducing lost portions of their body, is remarkable in this animal. Arms, legs, and tail, have been amputated, and new ones gradually formed. Even an eye has been extirpated, and a new one reproduced in the space of a year. They have the faculty also of recovering after being frozen up for a time in ice. Many other species, both terrestrial and aquatic, have been described, chiefly natives of North America. Among the batrachians of Cuvier were formerly arranged a number of animals which are very similar to the *Salamandridæ*, but which are well characterized by their not undergoing any change of form during any period of their lives. Such are the *Amphiuma* and *Protonopsis* placed now in a distinct order by themselves. See PSEUDOSAURIA. Also the CÆCILIA, and the truly amphibious animals called sirens, &c., forming an order under the name of PERENNIBRANCHIÆ, which see. Fossil frogs have been found in the coal formations of the Rhine, and toads in the Oeningen beds. Fossil salamanders have also been found in the latter formation, and when first discovered were considered as the remains of man himself. The species was ushered into the world of science under the title of "*Homo diluvii testis*," and afterwards described by the name of *Andreas Scheuchzeri*. It awakened great curiosity at the time, and excited the attention of naturalists, till Cuvier pointed out clearly its relations to the salamander. A gigantic batrachian has been discovered in the German Keuper, and in the sandstone of Warwick and Leamington. See LABYRINTHODON.

Batrachospermum (*βατραχος*, a frog; *σπερμα*, a seed).—A genus of plants belonging to the *Confervoid Algæ*, consisting of delicate, flexible, branched gelatinous plants of a green, yellow, red, or purple colour, resembling somewhat the ova of the frog. They occur in clear, slowly running fresh water streams, and the surface is covered with minute hairs, which give them a beautiful appearance when placed under the microscope.

Batrachus (*βατραχος*, a frog). *Frog Fish.*—A genus of acanthopterygious fishes belonging to the family *Gobiidæ*. The head is of great size and flattened horizontally, which gives the fish the appearance of the head of a frog. The species of which the genus is composed inhabit the southern hemisphere, and lie in ambush in the sand for the purpose of catching those fish on which they prey. The grunting frog fish, *B. grunniens*, inhabiting the Indian and American seas, is peculiar for the noise it makes when taken. This is like the grunting of a pig, and arises from the animal expelling air from the internal cavities through the mouth and gill flaps.

Bauhinia.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order

Cæsalpiniæ. The plants of this genus are generally remarkable for having the leaves divided into two twin lobes. This peculiarity induced Linnæus to give the name *Bauhinia* to the genus, in commemoration of the two brother botanists, John and Caspar Bauhin. Most of the species are twining plants, found in the woods of hot countries, stretching across from tree to tree, and forming an almost impenetrable barrier to the traveller. The flowers of many are very beautiful. *B. porrecta* is a small tree, a native of the West Indies, and known in Jamaica by the name of the mountain ebony, from its wood being sheathed with black. The bark of one or two species is made into ropes, and a gum is procured from others. The flowers and buds of *B. tomentosa* are dried and used in India as an astringent in cases of dysentery; and the bark of *B. variegata* contains a sufficient quantity of tannin to make it useful in tanning.

Bdella (βδελλω, to suck).—A genus of insects belonging to the order *Acaridæ*. See ACARIDÆ.

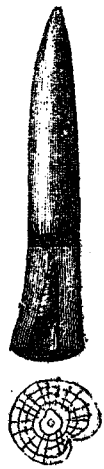
Bdellia (βδελλω, to suck).—A genus of animals belonging to the class *Annelida*, and family *Hirudinidæ*, or leeches. They are found in the fresh waters of Egypt, and a species was known to Herodotus, who asserted that it was found parasitic upon the crocodile.

Bdellium.—A kind of resin, the produce of a shrub found in Africa, and called *Heudelotia Africana*. Dioscorides knew this gum, and mentions three varieties of it. The smell is faint, and the taste bitter. See AMYRIDACEÆ. The bdellium of Scripture (Genesis, chapter ii.,) is a mineral, and must not be confounded with the substance above mentioned.

Begoniaceæ.—A family of dicotyledonous plants, the species of which are numerous, and found exclusively in the dampest parts of the tropical regions of Asia and America. They are semi-succulent herbaceous plants and undershrubs, of an elegant appearance, with beautiful pink flowers and heart-shaped leaves, often richly coloured with crimson. The leaves and stems of the young plants are acid, and have been used for tarts. The roots are astringent and slightly bitter, and those of *Begonia obliqua* are said to be purgative. It is sometimes called wild rhubarb. Some species, as *B. Malabarica* and *tuberosa*, are used as pot-herbs in the countries where they grow.

Belemnites (βελεμνον, an arrow or dart).—A genus of fossil mollusca. See BELEMNITIDÆ.

Belemnitidæ.—A family of fossil mollusca belonging to the class *Cephalopoda*, or cuttle fishes. They are commonly known in this country by the name of thunder-bolts. The shell of these animals consists of an internal horny pen, as in other dibranchiate cephalopods, of a spatuliform shape, broad in front, narrow posteriorly, and provided laterally with two small wing-shaped expansions, which unite posteriorly, and form a large conical cavity, at the bottom of which are transverse partitions, separating the whole into numerous small chambers pierced laterally with a siphon, and containing air. This posterior portion receives externally a calcareous deposit of a regular conical shape, more or less thick, and sometimes of considerable length. It is this terminal portion that is generally called the *Belemnite*. The spatuliform part with the



Belemnites sulcatus.

wings is called the *guard*, and the chambered conical cavity is called the phragmo-cone (φραγμος, a septum or division.) The object of this structure is evidently to support the body of the animal when it was alive, and give solidity to it, while at the same time being divided into chambers filled with air, it was light, and thus well adapted for supporting it in the water. It was lodged in the middle of the fleshy body of the animal, which in structure must have resembled the recent genus *Onychoteuthis*, and, to judge of some specimens of the shell, must have been four or more feet in length. Nearly a hundred species of the genus *Belemnites* have been found in a fossil state, ranging from the lias to the gault, and distributed over all Egypt. The *phragmocone* of the belemnite is exceedingly delicate, and usually owes its preservation to the infiltration of calcareous spar. The *guard* is very variable in proportions, being sometimes only half-an-inch longer than the phragmocone, at others one or two feet in length. The animals appear to have been gregarious, from the exceeding abundance of their remains in many localities, and to have lived at a moderate depth of water. A specimen of a shell belonging to the allied genus *Belemnoteuthis* has been preserved with the muscular mantle of the animal, the fins, ink bag, funnel,

eyes, and tentacles with their horny hooks. It was found in the Oxford clay at Chippenham.

Belemnoteuthis (*βελεμνον*, an arrow; *τευθις*, cuttle fish).—See BELEMNITIDÆ.

Bellerophon.—A genus of fossil shells belonging to the nucleobranchiate order of the class *Gasteropoda*. The recent molluscs of this order are all pelagic, and swim at the surface, instead of creeping on the bed of the sea. The *Bellerophons* appear to have been gigantic species of the family *Atlantidæ*. Their shells are rolled circularly upon themselves in the manner of the nautilus, a circumstance which caused them at first to be taken for fossil cephalopods. The whirls of the shell are few, strong, and often sculptured. About seventy species have been described, which are only found in the transition rocks, as the lower silurian and carboniferous. They are found in North America, Europe, and Australia.

Bellis (*bellus*, handsome).—A genus of plants belonging to the nat. ord. *Compositæ*. Several species are described, but the best known is *Bellis perennis*, the daisy. This "modest crimson-tipped flower" appears to be a general favourite throughout Europe. It flowers almost all the whole year, shutting up close at night and in wet weather. In some countries the leaves are used as a pot-herb. Several varieties of the daisy are cultivated in the garden, and form pretty plants for edges and borders.

Belone.—A genus of fishes belonging to the abdominal *Malacopterygii*, and family *Esocidæ*, or pikes. One species, *B. vulgaris*, is common on the English coasts, and rejoices in a variety of names. It is peculiar for having the bones of a green colour, and from this circumstance is named *Gar-fish* and *Green-bone*. It leaves the deep water in spring to deposit its ova near the shore, and from its preceding the mackarel in its annual visit to shallow water for the same purpose, it is often called *Mackarel-guide*. From its general resemblance to the pike, it is also called the *Sea-pike*. It is a slender much elongated fish of from twenty to twenty-four inches in length, and has a long narrow beak-like snout. From this configuration it has received the names of horn-fish, long-nose, goose-bill, and sea-needle. It is a very lively fish, and readily takes the bait. Quantities are brought to the London market in spring. The flesh eats like that of the mackarel, but is drier.

Belopteræ (*βελος*, a dart; *πτερον*, a wing).—A genus of fossil molluscs belonging to the class *Cephalopoda*, and family *Sepiidæ*. In all probability, the species which have been described are only portions of the bones of some of the extinct cuttle fishes. They are found in the eocene formations at Paris, and in Bracklesham Bay.

Beluga.—A genus of animals belonging to the order *Cetacea*. See DELPHINIDÆ. In the species called the white whale, there is occasionally found a morbid concretion, called the Beluga stone. It is usually of a size between that of a pigeon's and a goose's egg, and is very heavy. We are told the Asiatics of the Volga esteem it highly, when powdered, as a remedy in calculous disorders; and that they believe it facilitates the delivery of women in child-birth.

Belvisia.—A genus of monocotyledonous plants belonging to the nat. order *Belvisiaceæ*. The genus was founded by Paliset de Beauvois, upon a species he discovered growing in Africa, in the kingdom of Owara. He named it *Napoleona*, in honour of Napoleon, Emperor of France. Some time afterwards, at the downfall of the Empire, the name was changed, as being distasteful at that epoch, and that of *Belvisia* given to it in compliment to its discoverer. The species was originally described, and figured under the name of *Napoleona imperialis*; it is now named *Belvisia cærulea*;—"sic transit gloria mundi." It is a shrub growing to the height of seven or eight feet, and loaded with large, broad, bright, blue flowers, sitting close upon the branches.

Bembecidæ.—A family of insects belonging to the order *Hymenoptera*, some of which bear a strong resemblance to wasps. The species are not numerous. They are of considerable size, and of a black colour, intermixed with yellow spots. They are natives of hot climates. The female forms a deep oblique cylindrical burrow in the sand, with a cell at the end of it. Having formed this, she sallies forth to catch flies, and placing five or six in the cell, she then deposits an egg. Having carefully closed the mouth of the cell, she immediately commences making another, and as soon as the larvæ are hatched, they feed upon the imprisoned flies. The perfect insects are exceedingly agile, and fly rapidly from flower to flower, making a sharp and often interrupted humming noise. They exhale an odour of the rose. The larvæ of the genus *Bembex* are attacked by another insect *Panorpes carnea*, which introduces an ovum into the cell in the absence of the parent. This is soon hatched, and it then devours the larvæ of the *Bembex*.

Bembidiidæ.—A group of coleopterous insects, forming a sub-family of the large family *Carabidæ*.—They are minute carnivorous beetles, and are generally found on the margins of streams, by the sides of ponds, and some on the damp sands of the sea shore. They run about with great velocity, and bury themselves, when disturbed, in crevices in the ground or under stones, &c. The species are numerous, and in general they are of a bright blue or metallic green colour. One species of the family, *Cillenium laterale*, which occurs under stones and tufts of sea-weed on the Irish coast near low water mark, preys upon small crustacea, and passes a great portion of its existence under the sea, having the power of obtaining the necessary supply of oxygen during its submersion.

Benzoin.—A genus of plants. See LAURACEÆ.

Berberidaceæ. *The Barberry family.*—A

family of dicotyledonous plants, natives chiefly of the temperate regions of the Northern hemisphere. A number of species are known, most of them possessing bitter and acid properties. The best known species is the common barberry, *Berberis vulgaris*. It is a very widely distributed plant, inhabiting the north of Europe, Asia, and America. In the northern latitudes of Europe, as in Norway, it is a valley plant, but in the southern it becomes a mountaineer, and climbs Mount Etna to the height of 7,500 feet. In France, it is common in hedge-rows as a bush, but in Italy it becomes as large as a plum-tree. In this country it is often introduced into hedge-rows for its quick growth, but farmers have an idea that its proximity to corn-fields produces blight upon the corn. Its fruit is used to make a very pleasant acid confection. The bark and wood are astringent, and are also useful to dyers for staining yellow. The species of the genus *Berberis* are remarkable for the irritability of the stamens. If the filaments are touched with a sharp pointed instrument, especially during dry warm weather, they become agitated, bend forward upon the pistil, touch the stigma with the anther, and after remaining curved for a short time partially recover their erect position. The leaves of *Epimedium alpinum* are bitter, and said to be sudorific. The seeds of *Caulophylum thalictroides* have been employed as a substitute for coffee. The roots of *Leontice leontopetalum* contain so much alkali that they are used as a substitute for soap at Aleppo.

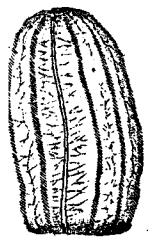
Bergamot.—A delicious scented essential oil, procured from the rind of a species of *Citrus* or orange. See AURANTIACEÆ. It is easily obtained, as the oil exists pure and ready formed in small cells in the outer skin. In Sicily, a large quantity is procured simply by squeezing the peel in the hand, and holding a small piece of sponge to the surface, which imbibes the oil as fast as it flows out. When the sponge is full its contents are pressed out into a vessel in which the oil is collected.

Bergmehl. *Mountain Meal* or *Flour.*—A powdery, more or less coherent mineral substance, occurring in Sweden, near Urnea, has been so called by the Germans. The inhabitants of the districts in which it is found have long considered it as nutritious, and frequently during times of scarcity the poorer classes have used it as an article of food, mixed with flour, or even with the ground bark of the birch tree. It is almost entirely composed of the siliceous valves of *Diatomaceæ*—the occurrence of which, owing to the indestructible nature of their skeletons, is very common. See DIATOMACEÆ.

Bernicla. *The Barnacle*, or *Bernicle Goose.*—A genus of web-footed birds belonging to the family *Anatidæ*. Several species are known, but the one which has obtained the greatest renown is *B. leucopsis*, the common barnacle goose. It is a native of the arctic regions, breeding in Russia, Lapland, Iceland, Spitzbergen, and other high latitudes, but making regular migratory visits in autumn and winter to the more temperate climes of England, France, Germany, Holland, &c. It frequents the north-west coast of this country in large flocks during winter, and its flesh is excellent. The history of this bird is rendered remarkable from the singularly marvellous tale connected with it. It was said to be produced by the cirripede, commonly known as the *barnacle*, *Lepas anatifera*, which is so common on drift wood, &c. This shell was even said to grow on trees overhanging the sea, and when this singular fruit fell into the water it forthwith opened and gave birth to the goose. Nor were there wanting *eye-witnesses* to the fact; as honest old Gerard, the botanist, has left it on record, that "what his eyes had seen and hands had touched, that he would declare." Sir Robert Murray, too, in the *Philosophical Transactions*, hesitates not to assert that he had opened 100 of the barnacles found by him on an old fir tree on the coast of Scotland, and discovered a perfect sea-fowl in every one of them! *B. ruficollis*, the red-breasted barnacle, is a beautiful bird, inhabiting the arctic countries of Asia, but periodically visiting Europe, and has, though rarely, been seen in England. *B. leucoptera*, the white-winged barnacle, is a native of the Falkland Islands, and is called there the bustard goose. It has not that disagreeable cackling cry, which is so characteristic of the rest of its kind, and its flesh is wholesome and nourishing.

Beroe.—A genus of marine animals belonging to the ctenophorous, or ciliograde *Acalephæ*. Their gelatinous body is of a symmetrical form, terminated at each extremity by an opening, and provided with projecting ribs, extending from the centre of the upper surface to that of the under, bristled with cilia. *Beroe ovata*, a native of the seas in the neighbourhood of the West Indies, about three inches and a-half in length, is remarkable for the liveliness of the motions of its short, slender, delicate cilia, and the beautiful variety of colours that rise from them as they play in the rays of the sun. *Cydippe* (*Beroe*) *pileus* is nearly globular in form, and in addition to the ribs furnished with the delicate cilia, is provided with two long filaments or tentacula, which are contractile, admitting of considerable motion, and possessing, like the ribs, numerous delicate cilia, which can be either spread out or spirally convoluted. The body is of a bright though pale blue colour, and the cilia, when in motion, present vivid iridescent hues. It swims through the water with considerable velocity, at one time shooting along like a meteor, and at another revolving on its own axis with inimitable ease and grace. It is common in the Channel, and in the seas farther north, and is said to constitue a great part of the food of the whale. A species called *B. cucumis*, is an elegant creature, found in the Scottish seas. "They vary from the

size of a lemon to that of a lady's thimble, are very beautiful, in shape resembling an antique pitcher, contracted at the neck, with a graceful revolution or turning back at the brim. The whole body has a tinge of pink, and the eight ribs closely set with cilia, are beautifully adorned, having on each side an edging like fine crimson lace. In the larger specimens, this lace-work is studded with little orange oval-shaped bodies, like small grapes, attached by a capillary peduncle. When the beroe was at rest, they rested; but when the cilia began rapidly to play, and the current of



Beroe Forskahlii.

water, mixed at times with air bubbles, to rush through the tubes of the ribs, then all the little orange bodies were in quick motion, as if dancing to the music of the spheres; or believing in fairies, as our forefathers did, one might have fancied that they were lace bobbins moved by nimble, invisible fairy hands, weaving the beautiful lace edging with which they were intermingled."—*Landsborough.* The species figured is *Beroe Forskhalii.*

Berthella.—A genus of molluscous animals belonging to the family *Pleurobranchidæ.* The shell is internal, or enclosed in the mantle, and is very thin and membranous. It is a native of Great Britain.

Bertholletia. *The Juvia Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Lecythidaceæ,* and named after Berthollet, the celebrated chemist. It forms part of the nat. ord. *Myrtaceæ* of many botanists. There is only one species known, *B. excelsa,* which forms large forests on the banks of the Oronoco, and northern parts of Brazil. It grows to 100 or 120 feet in height, and the fruit is as big as a man's head. The case is divided into four cells, each of which contains six or eight nuts, the kernels of which, when fresh, taste like the hazel nut, and contain a quantity of oil well suited for lamps. These nuts are sold in this country under the name of Brazil nuts. The inhabitants of Para drive a brisk trade with them, cargoes of which they send to French Guiana, whence they are shipped to London and Lisbon. The natives are very fond of this nut, and celebrate the harvest of the *Juvia* with great rejoicings.

Beryl.—A mineral substance occurring in rhombohedral crystals, and containing several varieties of precious stones. The two chief ones are the *Emerald* and the *Aqua-marine.* Emerald is the name given to that particular variety which is distinguished by the peculiar rich deep green, so well known as the *emerald green.* The other varieties are called by the general name of beryl;—those which are clear and transparent and possess a good colour, presenting sundry shades of sky-blue or mountain-green, being the precious beryl or aqua-marine. The finest emeralds are found in the mines in the Tunca valley, not far from the city of Santa Fé de Bogota; in the Heubach valley in Salzburg; in Peru and Upper Egypt. The best beryls are found in Siberia and Brazil. They are also found in the county Down, Ireland; and in Aberdeenshire, Scotland. The value of the emerald varies according to size and colour, &c. One weighing five grains and without flaw, is worth from £4 to £5. One of twenty-four grains is worth £96.

Beta (derived, according to some, from *Bett,* the Celtic word for red: according to others, from the Greek letter *β,* which form the plant assumes when swelled with seed). *The Beet.*—A genus of plants belonging to the nat. ord. *Chenopodiaceæ.* It is distinguished from the other genera by its having succulent roots. There are not many species. They are natives of the more northern parts of Europe, the north of Africa, and the western parts of Asia. Some are now cultivated as useful articles of food, &c. The common or red beet, *Beta vulgaris,* is originally a native of the coasts of the Mediterranean and Egypt, but is now most extensively cultivated for culinary purposes. The mangold wurzel, *B. altissima,* (by many considered only a variety of the preceding), is an object of extensive cultivation for feeding cattle, and is by many farmers esteemed as the most valuable of all the agricultural plants upon which cattle are fed in winter. It is also used, to a great extent, in France, for making sugar; and the produce is now about equal to that obtained from the sugar cane. An attempt has lately been made in Ireland to employ it for the same purpose. The sea beet, *B. maritima,* is a common European sea shore plant, and its leaves are used as spinach. They are, when dressed, extremely delicate and well flavoured.

Betula. *The Birch Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ;* and sub-order, *Betulaceæ.* There are several species, all, with one exception, natives of temperate and northern climes. The common Birch, *B. alba,* is the best known species. It is found growing all over Europe, from Lapland to the sub-Alpine parts of Italy; occurring on Mount Etna when we reach 4,762 feet of altitude. It is also a native of Asia, as far as the Altai mountains. As timber the birch is not of much value, but for an immense number

of purposes it is exceedingly useful. The bark contains numerous reservoirs filled with an aromatic oil, and also a peculiar resin called birch camphor. This is used for tanning Russia hides, and gives to Russia leather its peculiar odour. The wood is used for turning an immense number of small implements for agricultural and domestic purposes. Formerly it was employed for making arrows, bolts, and shafts; now, in this country, it is used for women's shoe-heels and pattens. The North Americans make canoes, boxes, and several domestic utensils from it. The bark is useful for dyeing wool yellow, and fixing fugaceous colours. In Sweden it has, in times of scarcity, been mixed up with meal as food. The Highlanders of Scotland, and the Norwegians use it for tanning leather, and making ropes. And in Norway it is dried, ground, and mixed with meal, and boiled up with other food for pigs, which thrive upon it. The Laplanders make shoes and baskets of it; and with large pieces, make garments to keep out rain. In Kamtschatka, the natives convert it into hats and drinking-cups. In France, they use the wood for making *sabots* or wooden shoes. The best kind of charcoal is made from it when burned; and the soot from it, when used as fuel, is a good lamp black for printer's ink. The vernal sap of the birch tree possesses a saccharine quality, and has been used both in a fermented and unfermented state, as a wholesome diuretic wine. At the siege of Hamburg, in 1814, almost all the birch trees in the neighbourhood were destroyed by the Bashkirs in the Russian service tapping them for their juice. The inhabitants of Finland use the leaves as tea. The seeds are the food of the siskin. The weeping birch, *B. pendula*, is a small elegant tree, and has been often confounded with the preceding, being considered only as a mere variety. *Betula nana*, the dwarf birch, is a native of Lapland. It is a small bush, but exceedingly useful to the natives, affording them the chief part of their fuel. The fruits are said to be the favourite food of the ptarmigan. There are several species natives of North America, which are very serviceable trees to man. The paper or canoe birch, *B. papyracea*, is the most valuable of them all. It grows abundantly, and rises to the height of seventy feet. The bark is the part of the tree most esteemed. It is very durable and much used for making canoes. Large strips of bark are detached from the tree and sewed together over a light frame-work of wood, the seams being caulked with the resin of the balm of Gilead fir. Canoes thus made are so light as to be easily carried on men's shoulders; and it is said one capable of carrying four persons and their luggage, will only weigh from forty to fifty lbs.

Betulites.—Fossil woods found in the lignites at Salshausen, in Veteravia; and which have been referred to the genera *Betula* and *Alnus*.

Beudantite.—A black mineral found at Horhausen on the Rhine. It consists of rhombohedral crystals, has a resinous lustre, and contains oxides of iron and lead.

Bezoar.—The name is now generally restricted to the calcareous concretions, composed of concentric layers which are formed frequently in the alimentary tube of herbivorous animals, and which acquire a considerable size. The Oriental bezoar, the *Lapis bezoardicus* of Linnæus, which at one time enjoyed such a high reputation as a talisman, is found in the fourth stomach of the Indian gazelle, *Antilope Cervicapra*. It possesses a strong aromatic odour. The substance which enters chiefly into its composition possesses the qualities of a resin. It melts with a gentle heat, and burns with much smoke. Similar concretions are found in various other animals; all of which are known by the general name of bezoars. In commerce, they are distinguished by the names of the animals in which they are found,—the *Hog bezoar* being found in the wild boar; the *Bovine bezoar* in the ox; the *Camel bezoar* in the camel. This latter is much prized by the Hindoos as a yellow paint. The *American bezoar* is derived from the stomach of the llama, but is not held in much repute. They are found in reptiles also; as in the cayman, and crocodile, and certain kinds of serpents. These latter were formerly held in high esteem.

Bibionidæ.—A sub-family of dipterous insects belonging to the family *Tipulidæ*. The species are small, and their flight is slow and heavy. There is a remarkable diversity in the opposite sexes of those belonging to the genus *Bibio*. The species of the genus *Simulium* are very troublesome insects. They are found in damp marshy places, flying in great swarms; and as all the parts of the mouth are fully developed, they are able to inflict a very severe wound. Some of the species are amongst the greatest torments to man, as well as to domestic cattle; and one of them is said to be peculiarly annoying to them in the Bannat of Temesvar in Hungary. Another species is very troublesome in Lapland; and in America the black fly, as it is called, is equally a pest to both man and beast.

Bibos.—A genus of oxen. See BOVEÆ.

Bignonia.—A genus of plants. See BIGNONIACEÆ.

Bignoniaceæ. *The Trumpet-flower family.*—A family of dicotyledonous flowering plants consisting of trees and shrubs, many of them showy, with handsome, large, and trumpet-shaped flowers. None of the species are distinguished for any active principles. Some are timber trees, and are valuable for their hardness. The species are numerous, about 450 being described. They are generally found in the hotter parts of Asia, Africa, and America; and form conspicuous objects in their native forests.

They are unknown in Europe except as cultivated plants. Some furnish dyes. From *Bignonia Chica*, which grows on the banks of the Orinoco, the Indians extract a red ochreous colouring matter with which they paint their bodies. *Bignonia leucoxylon*, the smooth five-leaved trumpet-flower, is a native of Jamaica, and grows to the height of forty feet. The wood is hard, and the juice and tender buds are said to be an antidote to the poison of manchineel. *Bignonia capreolata* is curious from the wood exhibiting a crucial arrangement of its layers. The *Catalpas* are likewise handsome trees, and one or two species have been introduced into shrubberies in England, their pretty flowers and large leaves forming a great ornament to the pleasure ground. *Catalpa syringæfolia* is a native of North America. A dye is obtained from it which stains wool of a cinnamon colour. A species grows in Japan, the leaves of which are laid by the natives upon parts of the body affected with pains, from a belief that they are beneficial to the nerves; and a decoction is used by them for the asthma. The calabash tree, *Crescentia Cujete*, belongs to this family. It is a native of the tropical regions of America, and produces a large melon-like fruit, containing a slightly acid pulp, which is sometimes eaten. Its pericarp is hard; and after the removal of the pulp, it is used as cups and bottles; and for many other domestic purposes. *Sesamum orientale*, a native of India, produces the seeds called teel seeds, from which an excellent bland oil is expressed. It is called by the Arabs *Sirùch*; and under the name of *Gingilee oil*, is used to adulterate oil of almonds.

Billbergia.—A genus of plants. See BROMELIACEÆ.

Biloculina (*bis*, twice; *loculus*, a small compartment).—A genus of minute animals belonging to the *Rhizopoda* or *Foraminifera*. As yet the shells only of these microscopic beings are known. A few are found recent, but they occur very abundantly in the fossil state. They belong to the tertiary formations, occurring in the Paris and London beds, and at Bordeaux, &c.

Bimana (*bis*, two; *manus*, a hand).—An order of the class *Mammalia*, containing the genus *Homo*, man. There is only one genus in the order, and only one species in the genus—viz., *Homo sapiens*, man; "the beauty of the world, the paragon of animals." There are several very distinct varieties of the human species. Blumenbach makes five, Cuvier refers them all to three, while Prichard increases the number to seven, and Pickering enumerates eleven. The five principal varieties of Blumenbach are—I., the Caucasian or white race—so called from its supposed origin in the Caucasus, occupying the central parts of the old continent—viz., Western Asia, Eastern and Northern Africa, Hindostan and Europe. II. The Mongolian or yellow race, occupying all the remainder of Asia—as Tartary, China, Japan, &c. The Finnish races of the North of Europe—the Laplanders, and the Esquimaux tribes diffused

Caucasian.

over the most northern parts of America, belong also to this variety. III. The American race, occupying all America, except those parts inhabited by the Esquimaux. IV. The Malay

Mongolian.

race, occupying the peninsula of Malacca and the islands of the Pacific Ocean. V. The Ethiopian or Negro race, occupying Western

and Southern Africa. New Guinea, New Holland, &c.

Negro.

Bipes (*bis*, two; *pes*, a foot).—A genus of reptiles belonging to the order *Saura* or lizards. They have only two legs, and these are more or less rudimentary and placed near the posterior extremity of the body. Three or four species are described. The first which was noticed was found by Pallas in Siberia, where the natives called it *Sheltopusik*. The legs are only rudimentary. It now forms a distinct genus under the name *Pseudopus*. Another species was brought from Australia; and Cuvier found that, in addition to rudimentary posterior legs, there were indications also under the skin of two anterior feet. It forms now the genus *Pygopus*.

Biphores.—A division of tunicated mollusca. See SALPIDÆ.

Birgus.—A genus of long-tailed crustacea, called tree lobsters, and purse crabs. See CRUSTACEA.

Biscia. *Bird Lime.*—A glutinous vegetable product related to caoutchouc. It is chiefly obtained from the inner bark of the holly; but is contained also in the seeds of the mistletoe and some other plants. It is prepared from the holly bark by bruising, long boiling in water, and fermentation. The mass is then again boiled in water and evaporated to a proper consistence. Bird lime, as its name imports, is principally used for catching birds.

Bismuth.—A metal of a reddish-white colour resembling antimony in appearance, easily broken, and readily reduced to powder. It forms the base of six different kinds of minerals—the principal of which are, native bismuth, and sulphuret of bismuth. Native bismuth is seldom found pure, being almost always mixed with a certain quantity of arsenic. The principal use of bismuth is to form alloys with various other metallic substances, such as tin—to which it gives more hardness and lustre. It is used in the fabrication of printers' types. With an equal weight of lead, it forms a brilliant white alloy much harder than lead. Eight parts of bismuth, five of lead, and three of tin, form Newton's metal which melts at the heat of boiling water. Pewterer's solder is formed of one part of bismuth, five of lead, and three of tin. Bismuth forms the basis of a sympathetic ink. It is found in Hanau, Swabia, Bohemia, Saxony, and Sweden.

Bison.—A genus of oxen. See BOVEÆ.

Bitumen.—A mineral substance of an inflammable nature. There are two kinds—viz., ASPHALTUM (which see) and *Elastic Bitumen* or *Fossil Caoutchouc*. This latter is a rare mineral which has only been found, as yet, in three places — viz. in Derbyshire; near Angers in France; and in Massachusetts, United States. It is soft and elastic like caoutchoue, and has the property possessed by this substance of effacing pencil marks. It consists, in a great part, of carbon.

Bivalvia. *Bivalve Shells.*—A term applied to those shells which consist of two parts, which open and shut—as the oyster, cockle, mussel, &c.

Bixa.—A genus of plants. See ARNOTTO.

Blaps.—A genus of beetles. See BLAPSIDÆ.

Blapsidæ.—A family of insects belonging to the *Heteromerous Coleoptera*, forming part of the family *Melasoma* of Latreille. The wings of these insects are generally obsolete, and the elytra soldered together. They are of a moderate size, and of a blackish colour. Their movements are very slow, and they are found in gloomy damp places—from whence they issue, only at night, in quest of food. When laid hold of, they discharge from their anus a liquid odour similar to that of the cockroaches. The genus *Blaps* is the typical genus of the family, and contains about fifty species. *Blaps mortisaga*, or the church-yard beetle, is the best known species in this country. It inhabits vaults and charnel houses, and is remarkable for the power it appears to possess of resisting the effects of submersion in alcohol,—instances having occurred of their repeatedly having revived after having been kept in it for many hours. The larva of this species has been described; and some curious instances are related of great numbers having been ejected from the human stomach. *Blaps sulcata*, a common species in Egypt, is eaten by the Egyptian women, cooked with butter, in order to make them grow fat. It is also used as a specific in ear ache, and against the bite of the scorpion.

Blastocerus.—A genus of deer. See CERVINA.

Blatta (βλαπτω to hurt or injure). *The Cockroach.*—A genus of insects. See BLATTIDÆ.

Blattidæ.—A family of insects belonging to the order *Orthoptera*. The insects of this family are distinguished by having very long antennæ (of from 50 to 150 joints), a large head almost

completely concealing the pro-thorax, and feet exclusively adapted for running. They are generally nocturnal insects, and run with great swiftness. The females, in most instances, are wingless. They exhale a very disagreeable odour, which adheres to all they touch. They attack all kinds of substances, animal and vegetable, devour all kinds of victuals, dressed and undressed, and damage all sorts of clothing, leather, paper, books, &c. They even eat the extremities of the dead, and it is well known, on board ship, that they nibble the nails to the quick of sleeping persons. In fact they are an exceedingly great pest, especially in hot climates. In those countries they remain quiet during the day, concealing themselves behind wainscoating, &c., &c.; but as soon as dusk comes on, they swarm out in myriads. Their eggs are enveloped in a capsule or case of a coriaceous texture, resembling in shape that of a bean. The larvæ when first born are quite white, and resemble their parents in form, but change their skin six times before they become perfect. Each egg-case contains from sixteen to thirty-six larvæ. These insects are scattered all over the world, and are excessively numerous. Those which are indigenous to this country are small, and out of door insects. Many which inhabit the tropical regions are large, some exceeding six inches in the expanse of their wings. The common cockroach, or black beetle, as it is vulgarly called, *Blatta orientalis*, is said originally to be a native of India, and introduced here through the medium of commerce. It is now thoroughly domesticated amongst us; and another species, said to be a native of America, *Blatta Americana*, larger than the last, is now also becoming very common in our houses, especially in seaport towns where merchandise is stowed. These two species in hot climates are very destructive. *Blatta lapponica*, a much smaller species, occurs in Lapland in great numbers, and is very troublesome to the natives, devouring sometimes, when very numerous, their whole winter's provision of dried fish. There are several hundreds of species known. The two genera, *Corydia* and *Phoraspis*, differ from all the rest. They are diurnal, have more lively colours, and are found in plants in blossom. The species of the latter genus live upon the sugar cane, the maize, and the gramineous plants in the forests of Guiana and Brazil. An infusion of the roots of *Nymphœa alba*, or white water lily, is said to kill cockroaches. They are readily eaten by many animals. Some birds, the hedgehog, the *Simia jacchus*, are all said to devour them readily. A species of lemur, *L. tardigradus* (*Nycticebus Javanicus*), in the possession of the writer, proved peculiarly adapted, on board ship, for destroying this pest. Being himself of nocturnal habits, when allowed to go at large in the cabin, he in a few weeks cleared it of all the cockroaches that previously infested it. A species of *Sphex*, in the island of Bourbon, is very destructive to them. With their sting, these insects produce a degree of stupefaction which renders the cockroach incapable of moving. They then deposit their eggs in the poor creature's body, and drag it to their nest, where it remains till the larvæ are hatched and able to feed upon it.

Blennius.—A genus of fishes containing those species known as the blennies.

Bloodstone.—A mineral so named from its being spotted with red, so as to resemble drops of blood. It is a jaspery variety of quartz, containing sesquioxide of iron. In the royal collection at Paris, there is a bust of Christ in this stone, so managed that the red spots represent blood.

Blubber.—The fat of whales and other large marine animals, lying immediately under the skin and over the muscular flesh, and from which our train oil is procured.

Boa.—A genus of snakes. See BOIDÆ.

Boehmeria.—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and closely resembling our common stinging nettle. Like many other plants of this order, the species of Boehmeria contain tenacious fibres, which are manufactured in considerable quantity into useful materials. *B. nivea* yields the fibre from which the Chinese grass cloth is made. It is a native of China, where it is largely cultivated for this purpose. *B. Puya*, a native of the upper districts of India, yields the pooah or puya fibre of Nepaul and Sikkim, which has long been extensively used in India, and is said to equal the best European flax when properly dressed. It forms excellent sail cloth and cordage.

Boidæ.—A family of reptiles belonging to the order *Ophidia*, or *Snakes*. The hinder limbs in the animals of this family, though not externally visible, are developed under the skin, formed of several bones, and end in a horny spur or true nail, projecting externally, and placed one on each side of the vent. The tail is generally prehensile. They live in marshy places. Fixing themselves by the tail to some aquatic tree, they allow their bodies to float on the water, and thus entrap the thirsty animals which come to drink. They kill them by powerful constriction, as they are not venomous, and swallow them whole. The name of boa is an old one, and is said to be derived from the belief that these serpents followed cattle and sucked the cows' udders. Innumerable fables were told by the ancients of huge and powerful snakes, which no doubt were originally derived from some of the larger species of this family. There are many genera, and numerous species. Of these, the *Pythons* are all natives of the Old World, and perhaps the best known. They are distinguished by their placing their eggs in a group, and covering them with their body. There are only two species, both natives of India. *Python reticulatus*, the ular sawa, is one of the most brilliant species of the whole family, its body being covered with a gay lacing of gold and black. It

grows to the length of thirty feet, and is stout in proportion. Its strength is enormous, enabling it to overcome even the powerful buffalo. The rock snake, *Python molurus*, is also of gigantic proportions, and may be seen alive in the collection at the Zoological Gardens of London. The Natal rock snake, *Hortula Natalensis*, a native of Port Natal, is another gigantic snake, attaining a length, in large specimens, of more than twenty-five feet, with a circumference of the body of a man. It feeds upon quadrupeds, and though, from its torpid state after gorging itself with food, it might be easily destroyed, yet the South Africans seldom attack it, from a superstitious belief that no person has ever been known to maltreat it without sooner or later paying for his audacity. Several other genera are natives of the New World. The aboma, *Epicrates Cenchria*, a native of the warm parts of South America, attains a gigantic size. The bajobi or green boa, *Xiphosoma caninum*, is smaller, but is remarkable for the great length of its teeth. The bite of this snake, though destitute of poison, is considered to be exceedingly dangerous from this circumstance; their teeth, penetrating deeply, injuring the nerves and producing lock-jaw. The *Boa constrictor*, or boiguacu, attains the length of thirty-five feet, and is a native of tropical America. It lives in swampy places, and feeds upon quadrupeds which come to the water to drink. The mouth and throat are very dilatable, and large animals, such as goats, deer, &c., are readily devoured. Twisting its huge body in folds around its victim, it soon crushes it to death, when, first lubricating the carcase with its saliva, it sucks it in as it were, and swallows it quite whole. The boa constrictor was formerly worshipped by the natives of America. The anaconda, *Eunectus murinus*, is another gigantic snake of tropical America. Its habits are the same as the boa, and when young the colours of the skin are very bright. The flesh is very white, and abounds with fat, which the Indians collect and use as a remedy for rheumatism, sprains, &c.

Bole.—An earthy mineral occurring in Armenia, Saxony, Italy, Ireland, Scotland, &c. It is a hydrous silicate of alumina. Its colour is various, being either yellow, brown, red-brownish or pitch-black; it has a greasy feel, and adheres to the tongue. The Armenian and French boles were at one time used in medicine. The only way in which bole is at present used, is as a coarse red pigment, for which purpose it is calcined and levigated, and sold in Germany under the name of Berlin and English red. In India, however, it is still in request; and even in this country it is sometimes employed in veterinary medicine. Bole is used extensively to adulterate articles of food, as anchovies, cocoa, &c. Some savage nations, as the *Ottomacs*, allay the pains of hunger by eating bole; and the Javanese, when they wish to become thin, eat cakes made of it called *tanaampo*.

Boletobius.—A genus of coleopterous insects belonging to the group *Tachyporidæ*, a sub-family of the *Staphylinidæ*. These insects live in fungi, especially in the species of boletus when in a state of decay. About eighteen species are found in this country.

Boletus (*βωλιτης*, from *βωλος*, a round mass).—A genus of fungi, containing those species commonly called "toad stools." See THALLOGENÆ.

Bolitophagus (*βωλιτης*, boletus; *φαγω*, to eat).—A genus of coleopterous insects belonging to the family *Tenebrionidæ*. They live for the most part in boleti and other fungi. Six species are known, only one of which is a native of this country.

Boltenia.—A genus of ascidian mollusca belonging to the class *Tunicata*. It consists of an oval or subreniform body, covered with a coriaceous scabrous envelope, and supported on a long narrow stalk or pedicle.

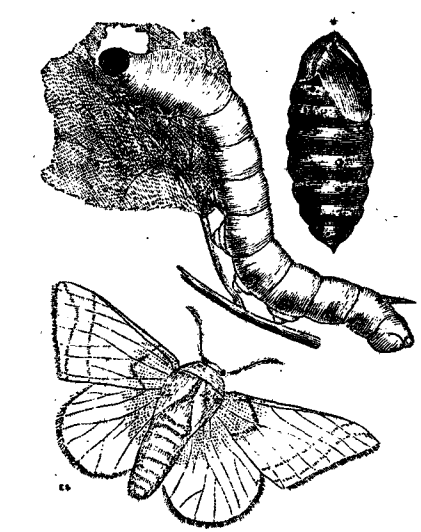
Bombaceæ.—A sub-family of dicotyledonous plants belonging to the family *Sterculiaceæ*. The species of this sub-family are usually large trees, with flowers of considerable size. In it, indeed, are contained some of the most majestic and beautiful trees that are known. The baobab tree is one of them.—See ADANSONIA. The genus *Bombax* is the type of the group, and contains several large trees, the seeds of which are surrounded with a silky cotton. *Bombax ceiba*, the common silk cotton tree, is very lofty, frequently attaining a height of 100 feet—and is a native of the West Indies and South America. The trunk of the tree is soft and spongy, and is made into canoes, some of which are sufficiently large to carry from 15 to 20 hhds. of sugar. The silky down which is contained in the seed vessel is very soft, but is too short to be spun into cloth. It is made into hats and bonnets, and used for stuffing chairs, cushions, and pillows. The bark of another species, *Bombax pubescens*, a native of Brazil, is very tough, and is made into ropes. The genus *Eriodendron*, contains several species, natives of America, which have stems excessively thick compared with their height, and spread enormously, near the ground, forming large buttresses with the angles of their trunks. Their stems are also defended by very large conical prickles, which remain till they are exfoliated by their gradual distension. The genus *Cheirostemon* contains a species which is called the hand tree. This tree is lofty, with the habit of a plane, hence called *C. platanoides*, and is found wild in the forests of Guatemala. The flowers are bright red, and the stamens are arranged in such a manner as to give the appearance of a man's hand. The tree is an object of curiosity and veneration in Mexico, and has been so from time immemorial. One tree was known to be growing near the town of Toluca, sixteen leagues west of the city of Mexico, at the time of the Conquest by the Spaniards, and was the only one known in all Mexico. It was supposed by the people of Toluca to be the only one ever created! Up to the year

1801, so constantly were the flowers gathered by the Indians as objects of veneration that the fruit never ripened; cuttings, however, were then transferred to the botanic gardens at Mexico, which struck root, and multiplied the vegetable wonder. Seeds from these have been obtained, and whole forests have been since then discovered growing wild near the city of Guatemala.

Bombax (*βομβυξ*, the silk worm).—The silk cotton tree. See BOMBACEÆ.

Bombus (*βομβος*, a buzzing noise).—A genus of insects belonging to the family *Apidæ*, and known by the name of humble bees. See APIDÆ.

Bombycidæ.—A family of insects belonging to the order *Lepidoptera*, forming part of the section *Nocturna*, or moths. Some of the species of this family are among the most gigantic of all the lepidoptera. The males in general fly swiftly in the day-time and in the evening, but the females are very sluggish and inactive. The larvæ have sixteen feet. They enclose themselves in cocoons of pure silk, frequently of a firm and rigid texture. The atlas moth, *Saturnia Atlas*, a native of China, measures from tip to tip of the wing upwards of eight inches. It feeds upon the orange, and the pupa is enclosed in a large and strong cocoon. *Saturnia Cynthia*, the arrindi silk worm of India, and *S. Mylitta*, are nearly of equal size as the preceding, and appear to be the wild silk worms of China. The cocoon of these two species are employed in India for the production of silk. Several other species yield silk also, as well as varnish and cements, &c.; but it is to the common silk worm, *Bombyx mori*, that the greatest interest is attached, and from the cocoon of which the whole of the European silk, and the greater part of that of China, is produced. This moth was originally a native of the northern provinces of China, and was unknown to the rest of the world till the reign of Justinian. The eggs were then brought to Constantinople by two monks, who had procured them secretly, and conveyed them concealed in hollow canes. They were thence introduced into Italy and France. The larva feeds upon the mulberry leaf, and about the middle of June it spins the important cocoon which produces the silk, and which, though it weighs but three grains, or even less, consists of a thread 900 feet long. It requires 2,000 silk worms to form a pound of silk. In 1833, the quantity of silk imported to this country amounted to 4,758,453 lbs., giving a duty paid of £59,682. The average imports for the years 1850, 51, and 52, amounted to 7,248,024 lbs. Great destruction is sometimes caused to the silk worm by a peculiar disease known by the name of muscardine. This is produced by a minute fungus, called *Botrytis Bassiana*, which occupies the whole of the interior of the body, and bursts through the skin. Many of the moths of this family, especially *Bombyx quercus*, are remarkable for the instinct which the male possesses of seeking the female from a great distance, and in apparently inaccessible situations. A male insect has been known to find its way into the pocket of a collector who happened to have a female in his collecting box. Instances have occurred of them finding their way down chimneys.



Bombyx mori—Moth, Caterpillar, and Cocoon—The Silk worm.

Bombycilla.—A synonyme of the genus ampelis, or *Wax-wing*. See AMPELIDÆ.

Bombyliidæ.—A family of insects belonging to the order *Diptera*. They resemble in some degree the smaller humble-bees, and are often called humble-bee flies. They fly very rapidly, making a humming sound as they dart from flower to flower with such excessive quickness that the eye can scarce follow their movements. They frequent open parts of woods and sunny banks, and may be seen hovering over a flower, and sucking the nectar with their long proboscis, without settling upon it. The species are most abundant in hot climates, only a few being European.

Bombyx (*βομβυξ*, the silk worm).—See BOMBYCIDÆ.

Bonasa.—A genus of birds belonging to the family *Tetraonidæ*, or grouse. *B. umbellus*, the ruffed grouse of America, is a handsome bird, resembling somewhat the pheasant, but is smaller, and has a fan-shaped tail. It is known in almost every quarter of North America, from Hudson's Bay to Florida. This bird is good eating, and is in best condition for the table in September and October. It feeds upon buds of trees, and various kinds of berries. In the pairing season the male makes a remarkable drumming noise with his wings, flapping them in the manner the domestic cock does, but producing a louder noise, which

resembles the rumbling of distant thunder, and can be heard a long way off. The female, upon hearing the noise, flies directly towards the place from whence the sound comes.

Bone.—The organ which in the higher animals forms the basis of the fabric of the body. It is an elaborate structure found in no class below the *vertebrata*. Phosphate of lime is the most characteristic component of bone. Bone is extensively used in the arts; in forming handles for knives, &c., and for various other useful purposes. Of late years, however, it has been of most use as a manure in agriculture. When bones or bone-dust are used for this purpose, its influence in increasing the crops of corn and turnips, and consequently the supply of butcher's meat and farm manure has been quite extraordinary. In 1827, Mr. Huskisson estimated the real value of the bones annually imported into this country for manure at about £100,000. In 1843 it was treble that sum. In 1841, the *ad valorem* duty of one per cent. on bones produced £2,933—showing the value of the imports must then have exceeded £293,000. By far the greater part of these was used for agriculture. They are principally brought from the Netherlands, Germany, and South America.

Bone-beds.—Accumulations of the bones of extinct animals, more especially of fish and saurian reptiles, are so called by geologists. They are not uncommon in various strata, but are local, and in no case very extensive. The thickest and most widely distributed are those of the lias.

Bonellia.—A genus of animals belonging to the class *Echinodermata*. It consists of an oval body and a long proboscis which is forked at the extremity. It lives deep in the sand, and projects this long proboscis till it reaches the surface of the water.

Bonplandia.—A genus of plants producing the angostura bark. See GALIPEA.

Bopyrus.—A genus of crustacea. See ISOPODA.

Boraginaceæ.—A family of dicotyledonous plants, of which the common borage is the type. The family contains upwards of fifty other genera and 600 species. Their surface is generally covered with stiff white hairs, which communicate a peculiar roughness to the touch—whence they were formerly called *Asperifoliæ* or rough leaved. They possess an insipid juice, and some contain a quantity of nitrate of potass, which imparts coolness to the water in which they are steeped. The common borage, *Borago officinalis*, has been used for its mucilaginous demulcent properties as a remedy in pectoral affections, and the flowers were at one time considered to possess cordial virtues. In England they form an ingredient in that mixture of wine, water, lemon-juice, and sugar, called "a cool tankard"—to which they seem to give an additional coolness. In this way it improves the taste of sherry or other white wine. In Italy, the young and tender leaves are used as a pot-herb and salad. Originally a native of Aleppo, it has become naturalized in most countries of Europe. The species of the genus *Lithospermum*, are equally rough to the touch. *Lithospermum maritimum*, which grows on our sea coasts, is one of our most beautiful indigenous plants. The leaves have a strong taste of oysters, and it is hence called in Scotland the "oyster plant."

Borago. *The Borage.*—See BORAGINACEÆ.

Borassus (*βορασσος*, the date). The *Palmyra* or *Fan Palm.*—A genus of plants belonging to the nat. ord. *Palmæ*. There is only one species—*B. flabelliformis*, called *Tala* in Sanscrit. It grows all over India, and is useful for affording fans and *punkahs* from its leaves, and a wine and sugar from its sap. It grows from twenty-five to thirty feet in height, from one to two feet in thickness, and has a large and widely-expanded leaf folded like a fan. The fruit is about the size of a child's head, and contains three seeds, each the size of a goose's egg. When young, these seeds contain a pulpy matter which is cool, sweet, and refreshing.

Borassus flabelliformis—The Fan Palm.

Borates.—Salts arising from the combination of boracic acid with salifiable bases, and consisting of several kinds or species; such as *boracite*, or sub-borate of magnesia; *rhodozite*, or borate of lime; *borax*, or borate of soda &c. *Borax*,

called also tinkal, is found in its native state, in crystals, enveloped in a kind of fatty matter. It is then of a greenish colour, and occurs in certain lakes in Thibet. It is found also dissolved in many springs in Persia, and may be obtained in considerable abundance in China. It occurs also in Peru, but is now manufactured largely from the waters of the lagoons in Tuscany, which are highly charged with boracic acid. Borax is employed in the arts as a flux in several metallurgical processes; and is very advantageously used in the process of soldering metals. The quantity imported into this country during the three years ending 1832 amounted to 170,392 lbs. a-year. In 1852, the imports of refined borax were 1,758 cwt.; of crude borax or tinkal, 5,716 cwt.; and of boracic acid, from Tuscany, 18,804 cwt.

Borax.—A mineral substance. See BORATES.

Boreus.—A genus of neuropterous insects belonging to the family *Panorpidæ*. The females of *B. hyemalis*, the only species known, unlike the rest of the family, have no wings, and the males only rudimentary ones. These insects are curious—from the circumstance of their being found in the winter months only; and are said to have been seen on the Alps running about in the snow.

Borrera.—A genus of lichens named after Mr. Borrer, a distinguished botanist.

Borreria.—A genus of dicotyledonous flowering plants belonging to the nat. ord. *Cinchonaceæ*. This genus is also named after Mr. Borrer. The species are numerous—upwards of eighty having been described; they are chiefly herbs or undershrubs, and nearly all natives of tropical America. Two species—*B. ferruginea* and *B. Poaya*, both natives of Brazil—yield a bastard ipecacuanha. The roots are possessed of an emetic quality and are frequently substituted for the true ipecacuanha.

Bos.—A genus of ruminant animals belonging to the family *Bovidæ*. See BOVEÆ.

Bostrichus (*βοστρυχος*, a curl of hair).—A genus of coleopterous insects belonging to the family *Xylophagi*. The insects of this genus are found on old trees. Their larvæ generally feed on dead wood, though they sometimes attack living trees also—burrowing in all directions under the bark; and thus, at times, where they are numerous, causing great havoc in large forests. They attack, in preference, resinous or coniferous trees. The typographer beetle, *B. typographicus*, has, at different periods, ravaged the forests of Germany; and, when once it has attacked a tree, there appears to be no remedy but to cut it down, bark it, burn the bark, and remove all the felled timber without delay.

Boswellia.—A genus of plants. See AMYRIDACEÆ.

Botany is that branch of science which comprehends the knowledge of all that relates to the vegetable kingdom; and is derived from the Greek word *βοτανη*, which signifies any kind of grass or herb. It embraces a knowledge of the external configuration of plants, their structure, the functions which they perform, the relations which they bear to each other, and the uses to which they are subservient. As we see in animals (see ANIMAL) that it is not easy to define what an animal is, so it is with plants—the strict definition of a vegetable is equally difficult. Many of the lower forms of plants possess *vibratile cilia*, which cause a motion apparently voluntary,—a function which formerly was considered to be peculiarly distinctive of animals. *Starch*, which at one time was considered purely a vegetable substance, is now found in animals also. In this way numerous objects which were heretofore considered animals—such as many of the infusoria of Ehrenberg—are now decided to be vegetables; whilst there are many others which the zoologist and botanist must still dispute the possession of.

Botaurus. *The Bittern.*—A genus of birds. See ARDEIDÆ.

Bothriocephalus (*βοθριον*, a pit; *κεφαλη*, head).—A genus of entozoa or intestinal worms belonging to the order *Cestoidæ* and family *Tæniidæ*. It is distinguished from *Tænia*, the common tapeworm, by having the head provided with two lateral, narrow, elongated and shallow pits. The articulations are broad and short, sometimes attaining a breadth of one inch. The species are many. One is found in the intestines of man, and often causes serious disorder to the constitution. It acquires, in some instances, a length of twenty feet. It is the common *Tapeworm* of the inhabitants of Poland, Russia, Switzerland, and some parts of France; and is seldom if ever observed in the inhabitants of Great Britain, Sweden, or Denmark, &c. See TÆNIA.

Botrychium.—A genus of ferns belonging to the nat. ord. *Ophioglossæ*. There is only one species growing in England, but which is found in almost every part of Great Britain, frequenting dry open heaths, elevated pastures, and waste lands. It is a small fern, and the pinnæ of the frond are lunate, which has given its specific name *B. lunaria* or moon-wort. Much superstition attached in former times to the ferns, and to this one amongst the rest. It was thought to possess magical virtues, and it was incumbent on the person who wished to use it, to gather it only by the light of the moon! When the witches were wont to ride through the air on broom-sticks, this fern was used by them to make their saddles! A species is found in North America called the rattlesnake fern, *B. virginicum*, which is the largest of all the species, and obtains its name from the fact of its growing in places where this venomous reptile is usually found.

Botryllidæ. *Compound Ascidians.*—A family of molluscous animals belonging to the class *Tunicata*. These animals form translucent jelly-

like masses of various colours, encrusting the surface of rocks or the leaves and stems of sea-weeds. In this mass live associated together numbers of individuals which present the appearance of stars—each star being a family, and each group of stars a community of beings. The species are tolerably numerous, thirteen genera having been described. The young, when first excluded from the egg, resembles somewhat the form of a tadpole, having a flattish oval body and a long tail. After swimming about freely in the water for a few hours, this larva, then about the size of a pin's head, attaches itself to the surface of some solid body, and becomes permanently fixed. Changes of form, after that, quickly commence. The tail disappears, the body becomes enlarged, and further changes take place, till about the end of the second week the animal appears in nearly its perfect form. The genus *Botryllus* is the typical form. In it the animals are grouped in single stars, the individuals being from six to twenty in each. *B. Schlosseri* is one of the most beautiful as well as one of the most common species of the family.

Botryllus.—See BOTRYLLIDÆ.

Botrytis.—A genus of plants belonging to the *Fungi*. See THALLOGENÆ.

Boulder.—Debris or masses of ancient rocks of large size, and transported to some distance from their origin, are called boulders or erratic blocks. Boulders are generally found not very far from the rocks from which they have been broken, but sometimes they have been met with transported to immense distances. Huge blocks of rock of this kind have been transported from Norway and Sweden to the plains of Germany; and from the mountains of Scotland and Cumberland to the centre and south of England. The only way to account for such large masses of rock having been conveyed to such great distances, is to suppose that they have been floated across the intervening space in masses of ice, which as they have melted, have dropped them in the places where they are found, when those places have been at the bottom of a sea. The largest boulders seem to have been drifted, in all cases, from colder points to warmer regions.

Bovea. *Oxen.*—A sub-tribe of animals belonging to the class *Mammalia*, order *Ruminantia*, family *Bovidæ* or hollow-horned ruminants. The species belonging to this sub-tribe formed the genus *Bos* of Linnæus, but by modern zoologists are divided into no fewer than seven genera. Some of these have a naked moist muffle, and live on the plains of warm or temperate regions; others have a hairy ovine muffle, and are only found in the mountains, or snowy regions. Of the first set, the bull or ox, *Bos taurus*, is the most important to man. During its life, it contributes most materially to his wants and his comforts; and when dead, every part is converted to his use. The ox appears, from the earliest periods of man's existence, to have been domesticated; and, as may be expected, exhibits many varieties—the results of domesticity. Forty-one varieties of this species have been enumerated. The cattle which anciently inhabited the great Caledonian forest, roaming wild and free, was a small kind; and the breed is still preserved, though they are restricted now to a very few places—such as Cadzow park near Hamilton, and Chillingham park in Northumberland. The zebu of India, or Brahmin bull, *Bos indicus*, is very small, and is remarkable for having long pendulous ears and a fatty elevated hump upon its withers. This species is held sacred by the Hindoos, who consider it sinful to kill them. They are made to work, however, and when harnessed to a carriage will travel thirty miles a-day. The hump is considered, by the European residents, when properly preserved, to be most delicious eating. A third species of the genus bos is found in Africa—the dante, *Bos dante*. This species has also a hump on the withers, and is considered to agree pretty exactly with the humped cattle represented on the ancient tombs of Egypt. The buffaloes which inhabit India and Africa, and which are found domestic in the south of Europe, are also of great importance to man. The common buffalo, *Bubalus buffelus*, in a state of domesticity, is universal in India. As they are very strong, they are employed in agriculture and in drawing and carrying burdens, being guided by rings through their noses. They are found wild in many parts of India, and are called *arnee* or *arna*. They inhabit the verge rather than the interior of primeval forests. They never ascend the mountains, but adhere to the most swampy sites of the district they live in. There is no animal upon which ages of domesticity have made so small an impression as the buffalo—the tame being still most clearly referable to the wild ones at present frequenting all the great swampy jungles of India. They generally live in large herds, except at the rutting season; and are fierce and stubborn animals. They are so powerful, that a wild buffalo will charge and prostrate a good sized elephant. The horns of the *Arna* are of prodigious size, sometimes measuring each six feet three inches in length, and eighteen inches in circumference at the base. The buffalo has been introduced into Italy, and is made great use of in that country as a beast of burden. The Cape buffalo, *Bubalus Caffer*, is of great size and massive proportions. It is a native of South Africa, and is found living in large herds in the plains skirted by woods. It is an exceedingly powerful animal, and when roused very savage. It is fond of wallowing in the mire. The flesh is tolerably good eating, and the skin so tough that it is in great request for harness. The gayal, *Bibos frontalis*, is found wild in the range of mountains that form the eastern boundary of the provinces of Aracan, Chittagong, Tippera, and Sylhet. The *Cucis*, or *Lunetas*, a race of people

inhabiting the hills immediately to the eastward of Chittagong, have herds of them in a domesticated state, which they rear chiefly for food. They are of a mild inoffensive disposition. The gour or gaur, *Bibos Gaurus*, is a native of the hilly district of India, inhabiting the primitive forests under the great mountain ranges of Nepal. They live in herds of considerable size, except at the rutting season. They are very shy, and it is exceedingly difficult to rear them in confinement, though the attempt has frequently been made. If approached they retreat, but if compelled to stand and defend themselves, they do so with a courage and determination not to be surpassed. Their flesh is excellent, both as regards flavour and tenderness. The bisons belong to this set also, and are exceedingly fierce and powerful animals. Their flesh smells of musk, which is called *Bisam*, and hence the name *Bison*. There are two species of bison, the European and American. The

Bison Bonasus—The Aurochs.

European bison or aurochs, *Bison Bonassus*, is only found now in the forests of Lithuania, Moldavia, Wallachia, and some parts of the Caucasus. These animals have never been domesticated, and appear to be approaching destruction, as civilized man extends his domain. They might almost have become extinct by this time, had not they been taken under the protection of the late Emperor of Russia, who had a number of herds in the forest of Bialowicza in Lithuania, under the care of a certain number of herdsmen. They are very shy, but if approached accidentally they become furious, and passionately assail the intruder. The American bison, or as it is universally called in America, the buffalo, *Bison Americanus*, is a native of North America, and, in its form and make, presents a model of brute force, formed to push and throw down. Congregating in vast herds, these animals are said to cover the wide extended savannahs of the more southern districts of the north for miles in extent. Like all wild animals, it retreats before the civilizing presence of man. Formerly it was found throughout almost the whole territory of the United States; but at present it is scarcely see eastward of the Mississippi, and south of the S Lawrence. Every year its rovings are restricte Civilization, in its steady march, destroys th larger gregarious animals; and even drives bac the hunting man, unless he change his mode c life. In pursuing a great herd of buffaloes, par ticularly if it consist of bulls, a strong odour o musk is emitted, and is left in their wake. Thei feet make the grass crackle as if it were on fire They have a very quick scent, and smell a ma at two or more miles off to windward of him Of the species which live in the mountains o snowy regions, the yak, *Poephagus grunniens*, i a prominent example,—it is a native of Thibet inhabiting the loftiest plateaux, being unable t live beyond the immediate vicinity of the snows They are domesticated, and used for the plough and for riding. They grunt like pigs. The tribes of the Cachars or Juxtanivean regions of th Himalayas rear large herds of them, and they cross-breed with the common ox. The musk ox *Ovibos moschatus*, is a native of the barren land of North America, lying to the northward of th 60th parallel. They are of small size, live o grass and lichens, and run fast, climbing rock and hills with great rapidity. Their flesh, whe they are fat, is said to be well tasted, but whe lean smells strong of musk.—Fossil remains o oxen have been found in considerable abundanc in the tertiary beds in England, Russia, Spain Italy, North America, and in India among th Sewalik mountains at the southern feet of th Himalayas. One species, *Bos primigenius*, ha been found in the London clay. It resemble strongly the common ox, but must have bee much larger. Professor Owen is of opinion tha it is a distinct species; but Cuvier considers it t have been the original stock of the domestic ox of the present day, the traces of which in a wil state have disappeared by the progress of civilization. Remains of a species closely resembling the aurochs have also been found in different part of the continent of Europe and in Great Britain This species, which has been called *Bison priscus*, is reasonably supposed to be the origin o the present existing aurochs, and we thus find that this noble animal at one time existed i this country, and perhaps roamed the forest of Great Britain, posterior to the creation o man.

Bovidæ. *Hollow Horned Ruminating Animals*—A family of animals belonging to the class *Mammalia*, order *Ungulata*, or hoofed animals The species belonging to this family have the toes hoofed, and the stomach adapted for ruminating or chewing the cud. The two middle toes are separate, and the frontal bones are generally armed with horns, which are usually hollow. The gullet is provided with two long pouches, just before the stomach, used for holding and soaking the food before it is chewed. This family contains the oxen, Bovina; the giraffes, Gir-

AFFINA; the deer, CERVINA; the musk deer, MOSCHINA; and the camels, CAMELINA.

Bovina.—A tribe of animals belonging to the large family *Bovidæ*. In the animals of this tribe the horns are permanent, covered with a persisting horny sheath, cutting teeth only in lower jaw. It contains the oxen proper, BOVEÆ; antelopes, ANTILOPEÆ; strepsiceres, STREPSICEREÆ; the goats, CAPREÆ; and sheep, OVEÆ.

Bovista (*Boſist*, the German name for it).—A genus of plants belonging to the nat. ord. *Fungi*, and known in this country by the name of bull puff-ball, or bull-fice. It is closely allied to the genus *Lycoperdon*, from which it differs in having a double peridium. *B. gigantea*, the bull puff-ball, frog's cheese, or bull-fice, grows to an immense size, specimens having been collected measuring as much as nine feet in circumference. When young the interior is full of a white, moist, mass of tissue, which becomes at length brown and dry, and upon being pressed escapes in the form of a powder. This powdery matter, when examined by the microscope, is found to be composed of sporules. A singular fact has been lately discovered connected with this fungus. When burnt, the smoke arising from it, possesses a narcotic property, which, when inhaled by man or the lower animals, acts in the same manner as ether or chloroform. This fungus, when young and fresh gathered, is edible, and is occasionally served up at table fried in egg and bread crumbs. *B. furfuracea*, a native of Italy, growing on the heath in the neighbourhood of Florence, is much used there as an article of food.

Brachelytra (βραχυς, short; ἐλυτρον, elytra) *Rove Beetles.*—A family of insects belonging to the order *Coleoptera*, and synonymous with *Staphylinidæ*. The species are characterized by their having short elytra or wing cases, though the wings themselves are very long, and when at rest easily folded up. They run and fly with equal agility, though they do not often use their wings. Most of the species have the habit of bending up the abdomen while running, and some bend it up so completely on the back that they present quite a globular form. At the lower extremity of the abdomen are two conical vesicles, capable of being protruded at will, and from which a vapour is emitted which occasionally is very subtle and penetrating. In some of the species the smell is that of spices mixed with something indescribably fetid. They are very voracious, generally preying upon dead bodies and decaying vegetable matter, such as fungi, &c. Some, however, are only found in flowers, on the margins of running streams, or under the bark of decaying trees. Others again are found parasitic in the nests of the hornet, and a few live in society along with the red ant (*Formica rufa*). The larvæ resemble the parents, and live in the same places as they do. A great number of species are described.

Brachinides (βραχυς, short).—A sub-family of coleopterous insects belonging to the family *Carabidæ*. This group, as at present constituted, is one of the most incongruous of all the tribes of the *Carabidæ*. The typical genus is *Brachinus*, the bombardier beetle, many species of which have been described. They live under stones, and are found in most parts of the globe. They have the singular faculty, when they are annoyed, or alarmed by the attack of an enemy, of violently expelling from the anus, accompanied by a loud detonation, a pungent acrid fluid of so volatile a nature, that immediately upon coming into contact with the atmospheric air it becomes a bluish vapour, and leaves behind it a penetrating odour like nitric acid, and which, like it, reddens litmus paper. It acts as an effectual means of defence against its pursuer, and it is sufficiently acrid to produce upon the skin the sensation of burning. The apparatus in which this power is lodged, is placed in the abdomen. When much harassed, *Brachinus displosor* can discharge ten or twelve explosions successively. *B. crepitans*, the typical species, lives in society; and it is said these communities sometimes consist of at least 1,000 individuals. A considerable number of other genera belong to this sub-family, a great proportion of which are exotic.

Brachinus.—A genus of insects.—See BRACHINIDES.

Brachionæa.—A family of minute animals belonging to the class *Rotatoria*. The animals of this family possess a carapace or shell which encloses the body like the shell of a tortoise, allowing the tail to protrude. They have two simple rotatory organs. These sometimes appear as if they were composed of five parts, three of which are central, and two lateral. The two lateral ones only, however, are the wheels, the central ones being merely ciliated frontal portions of the carapace, the cilia of which remain extended without motion, during the action of the others. The family is represented by the genus *Brachionus*, the species of which have a single eye spot, and the tail forked. *B. urceolaris* is the most characteristic species, and is very common in fresh water ponds and ditches, such as the Serpentine in Hyde Park, the cisterns of the Jardin des Plantes at Paris, &c. It is of a reddish colour, and has the carapace quite smooth. Ten other genera of this family are described, all of which were originally included under the one genus *Brachionus*.

Brachiopoda (βραχιων, an arm; πους, a foot).—A class of molluscous animals, characterized by having a bivalve shell of symmetrical form, and by the animals being destitute of motion, and fixed to or upon solid bodies. Of all molluscous animals, the brachiopoda appear to enjoy the greatest range both of climate, depth, and time. They are found in polar and tropical seas, in pools left by the ebbing tide, and at the greatest depths hitherto explored by the dredge. At present only seventy recent species

are known, but above 1,000 distinct species have been described, which are distributed throughout all the sedimentary rocks of marine origin, from the Cambrian strata upwards. The oldest form of organic life at present known, either in the old or new world, is a species of *Lingula*. Some of the genera belonging to the class are attached to foreign bodies by a fibrous pedicle; such are *Lingula*, *Terebratula*, and *Discina*—whilst others are fixed by the substance of the central valve, as *Thecidia* and *Crania*. When first hatched, the young are most probably free, and able to swim about until they meet with a suitable position. They are then most likely attached by a byssus, which in time becomes consolidated, and forms a permanent organ of attachment. The shell of *Terebratula*, the lamp-shell, is minutely punctate, and the ventral valve has a prominent beak, which is pierced at its extremity by a round hole. Through this the pedicle issues by which the animal is attached. Internally there is a peculiarly delicate and elegant testaceous apparatus which is attached, generally in the form of a more or less complicated loop, to the inner surface of the dorsal valve. This apparatus differs so much in different species, that it has lately been used as a character for sub-dividing the genus into a number of sub-genera. The recent species of *Terebratula* are widely diffused, appearing capable of flourishing in extremely warm and in extremely cold regions; as well as in more temperate climates—ranging from the Indian seas to the 70th degree of north latitude. The fossil species are numerous, and occur principally in the more ancient fossiliferous beds. The genus *Lingula* has a shell, which is of a horny texture, and is supposed to be attached by a long fibro-gelatinous pedicle passing out between the valves. The recent species are not numerous, and little is known of the habits of the animal. Several species occur fossil in the inferior oolite of Yorkshire, and in the old red sandstone. *Discina* is attached by a pedicle passing through a hole in the ventral valve. The shell is orbicular, horny, and minutely punctate. The animal is transparent. The recent species are only seven, and are found attached to stones, shells, &c., and occur at depths ranging from not far below the surface to seventeen fathoms. Twenty-nine fossil species have been described from the silurian rocks. The genus *Thecidium* is composed of small shells which are attached to corals, &c., by the beak. Only one recent species has as yet been ascertained. It is found in the Mediterranean. The animal was unknown till lately, though the species *Thecidium Mediterraneum* has long been known, occurring amongst the red coral of the Tuscan seas. Twenty-seven fossil species have been described. *Crania* has an orbicular, hingeless shell attached to rocks and stones in deep water by the umbo, or whole breadth of the ventral valve. *Crania anomala* is a gregarious species, living in masses attached to rocks and stones, in from 40 to 150 fathoms depth of water. Five recent species only are known, but twenty-eight fossil species have been described. The fossil genera of brachiopods contain *Spirifera*, *Productus*, *Calceola*, &c.

Brachycerus (βραχυς, short; κερας, horn).—A genus of coleopterous insects belonging to the family *Curculionidæ*. The species are oval or globular in form, and are covered with rough points or rugosities. The elytra are soldered together, and they are destitute of wings. They are always found on the ground, or crawling slowly amongst rocks and stones. The species are known only in the hot and dry countries of the old continent—112 species are described, most of them natives of Africa. The women of Ethiopia string these insects together, and wear them round their necks as an amulet.

Brachyura (βραχυς, short; ουρα, a tail).—A section of crustacea. See DECAPODA. The animals belonging to the decapodous brachyura have their abdomen or tail very short, generally bent under the body, and lodged in a cavity there, so that it is of little or no use to them in swimming. The branchiæ or gills are of a pyramidal form, and consist of a double series of plates piled one above another. They are defended by the lateral edges of the carapace being bent down in order to cover them. The water thus reaches them only through a special opening left in front of the shell. The species belonging to this section are very numerous, and have been divided into several large families. In some, *Oxyrhyncha*, the carapace is narrowed to a point anteriorly as in MAIA—which see. In others, *Cyclometopa*, the carapace is very large, regularly arched anteriorly and narrowed posteriorly, as in CANCER and CARCINUS—which see. In *Portunus*, which belongs also to this family, the last pair of legs have the joints broad and flat, and formed for enabling the animal to swim well. They are called the swimming crabs—are active and bold, and seize hold of objects with great sharpness, pinching very severely with their acute claws. A third set, *Catometopa*, have the carapace generally quadrilateral or ovoid, as in GECARCINUS and GRAPSUS—which see. Whilst a fourth, *Oxystoma*, have it in general orbicular or arched in front, as in *Leucosia*, or the Porcellanous crab, found in New Guinea and India; and *Corystes*, or globular crab, a species of which, the masked crab, is found on our own shores, lying burrowed in the sand, with only its long antennæ or feelers protruding.

Bradypidæ (βραδυς, slow; πους, a foot). *The Sloths.*—A family of animals belonging to the class *Mammalia*, order *Ungulata*. They have a short rounded head, no true cutting teeth, and canines similar to the grinders. Their limbs are very long and weak, and the toes armed with very long compressed claws. Their stomach is divided into four cells or pouches. They live on trees, and feed upon leaves. The family consists

of two genera, *Bradypus* and *Cholœpus*. The best known and most remarkable species of *Bradypus* is *B. tridactylus*, the three-toed sloth or Ai. It is a singular looking animal, and at first sight appears most awkwardly made, most ill-conditioned and defenceless. The arm and fore-arm taken together are nearly twice as long as the leg and thigh, and the fingers are short and so perfectly rigid that their joints ossify at an early period of the animal's life. They are completely enveloped in the common integuments of the hand, leaving nothing to be seen externally but the long claws which terminate them. The animals are thus, when placed on the ground, incapable of active motion; but it is very different when they are seen in their native haunts clinging by their long hooked claws to the branches of trees. They spend their whole life in the trees, suspended from the under surface of the branches. Hanging thus, they move along with considerable ease and agility, and when they rest or sleep they still remain suspended. In high winds the sloth travels faster than at other times; and as the hair of its skin presents a dry and withered appearance, it is only when thus in motion it is readily distinguished from the tree upon which it lives. It emits a feeble plaintive cry which resembles the word *Ai*, hence its common name. It is a native of the dense tangled forests of South America, where hundreds of miles may be traversed by passing from one tree to another. It feeds upon leaves, and the female brings forth but a single young one at a birth. This she carries on her back; and the young sloth adheres to its parent till it acquires sufficient size and strength to shift for itself. When full grown it is about the size of a cat. The two-toed sloth, *Cholœpus didactylus*, is larger than the preceding, and its muzzle is more elongated. This likewise is a native of the hot parts of South America.

Bradypus.—See BRADYPIDÆ.

Brain.—The soft and pulpy organ which in man and other vertebrate animals occupies the cavity of the cranium, and forms the central mass of the nervous system. It is for the most part divided into three portions, the *Cerebrum* or brain proper, the *Cerebellum* or little brain, occupying the lower and back part of the cranium, and the *Medulla oblongata* or spinal marrow, which passes out of the cranium into the vertebral column, and is continued throughout that canal under the name of spinal cord. The brain of man is large compared with that of other mammalia, and is supposed to constitute about $\frac{1}{36}$th part of the weight of his body. In the dog it is the 120th part; in the horse the 450th part; in the sheep the 750th part; and in the ox the 800th part. In birds it bears somewhat the same proportion; but in fishes it is much smaller—in some species not constituting the 2000th part of the bulk of the fish. In the invertebrata there is no brain or spinal marrow, properly speaking, but instead there are masses of nervous matter called ganglia distributed through the body whence proceed the nerves. The upper ganglion represents the brain.

Brama. *The Bream.*—See BRAMIDÆ.

Bramidæ. *The Bream family.*— A family of acanthopterygious fishes nearly allied to that of the Chætodons. It differs from that family in the species having teeth in the vomer and palate. The body is generally short and compressed, and the fins are scaly. *Brama Raii*, or Ray's bream, is a native of the Mediterranean, but occasionally wanders on to the coasts of England, and is said to be delicious eating. *Toxotes jaculator*, the archer fish, is, however, the most remarkable species belonging to the family. It is found in Java and Sumatra, and has been long celebrated for the singular instinct it displays in catching flies and other insects which form its food. The under jaw is a good deal longer than the upper, and enables the animal to squirt or project small quantities of water to some distance, and with considerable force. When it sees a fly or other insect settled on a leaf of some of the aquatic plants floating on the stream, it shoots a single drop of water with such unerring aim as to precipitate the creature into the water, and thus bring it within its reach.

Branchiæ (βραγχιά, gills of a fish.) *Gills.*—The organs called branchiæ are vascular respiratory organs, destined to submit to the process of oxygenation the blood of the greater part of aquatic animals. It is by means of the oxygen of the air dissolved in water that this method of respiration is performed. As the name imports, these organs are more or less branched. They are situated upon special parts of the body, but their position varies according to the animals in which they have been observed. Their surface, multiplied proportionately to the number of their ramifications, is always covered with a very fine and permeable membrane. In fishes the gills consist of arches of bone attached to the *os hyoides* or bone of the tongue. To these the rays or filaments of the gills are attached, generally in a row upon each, and varying in number, and having their surfaces covered by a tissue of innumerable blood-vessels. Upon these is stretched the gill membrane. The water taken in by the mouth passes through among the filaments of the gills, and escapes by the gill openings in the rear. In its progress through the filaments of the gills, the oxygen is separated from the atmospheric air contained in the water, and carbon is given out in return.

Branchiobdella (βραγχια, gills; βδελλα, a leech).—A genus of animals belonging to the class *Annelida*, found parasitic upon the branchiæ of the cray fish. The typical species, *B. astaci*, is small, hermaphrodite, and is fixed to the gills of the common cray fish by a fine brown pedicle. Two other species have been described, one living parasitic on the cray fish of Chili; the other upon a mollusc.

Branchiopoda (βραγχια, gills; πους, a foot).—A division of the entomostracous crustacea. The animals belonging to the branchiopoda have the mouth furnished with jaws fitted for masticating their food. Their branchiæ or gills are many, and attached to the feet, which vary in number, sometimes being many, and at others few. They are in general not adapted for locomotion. The antennæ are two or four-jointed and ciliated, in some serving as organs of motion. They swim freely, and may be observed to have their branchial feet in constant motion in the water, their action being seldom interrupted—thus ventilating the stagnant water in which they for the most part live, and preventing it becoming soon putrid. This division includes the genera *Apus*, *Nebalia*, *Branchipus*, and several others.

Branchiostegi (βραγχια, gills; στεγος, a covering).—A tribe of cartilaginous fishes, comprehending those in which the gills are free and covered by a membrane, such as the sturgeon and chimæra, &c.

Branchiostegous.—Having gill covers, as a *branchiostegous* fish; or covering the gills, as the *branchiostegous* membrane.

Brassica. *The Cabbage.*—A genus of plants belonging to the nat. ord. *Cruciferæ*. Several species of this genus are valuable plants for culinary purposes, and for feeding cattle. The rape, colza, or coleseed, *B. napus*, grows wild in England, and is much cultivated by farmers for its valuable oil. The wild turnip, *B. campestris*, is found indigenous also to this country, growing by the sides of rivers and ditches, and by the borders of fields, &c. It is considered to be the original of the Swedish turnip, and a variety possessing a caulescent fleshy root, is by many botanists made a distinct species. *B. rapa* is supposed to be the original of our common turnip. The cabbage, *B. oleracea*, is met with in abundance growing wild upon the cliffs of many parts of Europe, such as about Mount Athos in European Turkey, and is not uncommon in various parts of England. From this wild plant we have derived by cultivation and domestication our cabbages, cauliflowers, broccoli, savoys, &c. Cabbages appear to have been a favourite esculent vegetable with the Romans; and our Saxon ancestors used to call the month of February *Sproutcale*. A species found in China, *B. chinensis*, yields a good oil called Shanghai oil.

Braula (βραυλα, louse).—A genus of insects which has lately been discovered, parasitic upon bees in May and June, and which has not yet been referred to its proper place in the system. Nitzch places it in the order *Diptera*, and family *Coriaceæ*. The only species known, *B. cœca*, is about the size of a flea, and resembles in form a small spider. It attaches itself strongly to the thorax of the bee by means of its feet. Sometimes it is motionless, and at others it lifts the anterior part of its body, and moves its feet like the *Nycteribiæ*, parasitic on the bat.

Brayera.—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*. One of the species is a native of Abyssinia, *B. anthelmintica*, and from it is obtained the Kousso or Cusso, an excellent anthelmintic medicine, esteemed now as the best remedy we have for tapeworm. See BANKSIA.

Brentidæ.—A sub-family of coleopterous insects belonging to the large family *Curculionidæ*. The insects belonging to this sub-family are elongated and thin, and the whole body has almost a linear form. They are as it were the caricatures of the family to which they belong. They are found on trees or under the bark, and are for the most part natives of hot climates. One species, *Brentus septentrionalis*, is found in America living on the white oak. The female, when about to lay her eggs, punctures the bark with her slender snout, and drops an egg in each hole thus made. The grub, as soon as it is hatched, bores into the solid wood, burrowing to some extent, and in these burrows the insect undergoes its transformations.

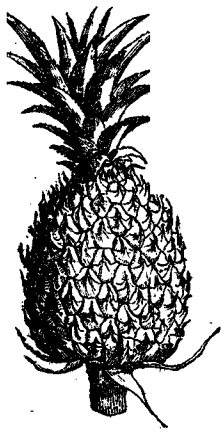
Briza.—A genus of grasses. The flowers are generally in dense clusters, which are hung upon the ends of a very delicate filamentous peduncle, forming an elegant panicle which shakes with the slightest breath of air. There are two species natives of Great Britain, and from their habit are called quaking or trembling grasses. In Berwickshire, among the Lammermuir hills, the *Briza media* is termed *siller tassels*.

Brochantite.—A native hydrous sulphate of copper. It occurs crystallized, and has an uneven fracture. The colour is emerald-green, the lustre vitreous. It is translucent and transparent. It is found in Siberia.

Bromelia.—See BROMELIACEÆ.

Bromeliaceæ. *The Pine Apple family.*—A nat. ord. or family of monocotyledonous plants, of which the common pine apple is an example. The species belonging to the family are herbaceous plants, stemless, or very short stemmed, and remarkable for the hardness and dryness of their gray foliage, the leaves being rigid, channelled, and often spiny at their margin. They occur in greatest abundance in the warm parts of America. The pine apple, *Ananassa sativa*, is one of the most delicious fruits we have. Originally a native of the hot parts of South America, it has been introduced into Africa and India, and now with care and management is brought to great perfection in Europe. The importation of pine apples from the West Indies to England has of late years formed a considerable branch of commerce. From the fibres of the leaves a fine muslin is prepared. At first the fruit is a mass of flowers, the calyces and bracteæ being united together, but afterwards it becomes succulent. It is covered on all sides with small triangular scales, and resembles in appearance the strobile of the pine tree; hence its common English name. There are many varieties of this fruit

cultivated. *Bromelia pinguin*, a native of the West Indies, is used as an anthelmintic and



Ananassa sativa—The Pine Apple.

diuretic. The leaves are five or six feet long and spinous. Hence it is used for making hedges or fences for pasture lands, and these are almost impenetrable. The leaves of *Bromelia nudicaulis* and various other species, as some of the *Tillandsias*, are always packed so closely at the base that they form a sort of cup for retaining water, which affords a delicious cool draught to the thirsty traveller or hunter traversing the woods where they grow. Most of the plants of the family are more or less epiphytic, being able to grow without any direct attachment to the soil. The *Tillandsias*, for instance, are hung suspended from balconies in South America as air plants. *Tillandsia usneoides*, the tree beard or black moss, has the appearance of the beard moss or lichen, so commonly seen on trees in Britain, and is used for stuffing cushions and mattresses. From the spike of *Puya lanuginosa* a gum flows; and a dye is extracted from the root of *Bilbergia tinctoria*.

Bromius (βρομιος, buzzing).—A genus of coleopterous insects belonging to the family *Chrysomelidæ*. The species of which the genus is composed are separated now from the genus *Eumolpus* to which they were formerly referred. *B.* (*Eumolpus*) *vitis* is very common in France, and is only too well known from the ravages it commits upon the vine. In its perfect state the insect fixes itself upon the under surface of the leaves of this plant, and perforates them by many irregular holes. If disturbed it allows itself to fall, then, describing a curvature, fixes itself again to the under surface of the leaves nearest to the ground. When taken hold of it feigns death. The larvæ are found in the grapes, the grains of which are very shrunk and blackened

Bromus.—A genus of grasses containing many species, of which several are natives of Great Britain. *B. mollis*, the soft Brome grass, forms a large part of many of our pastures, and is cultivated in some parts of the south of Scotland, as rye grass is in England. *B. catharticus* is a native of Chili, where the inhabitants use a decoction of its root as a purgative.

Bronze.—An alloy of copper and tin, made in different proportions, giving copper more hardness, resistance, and sonorous quality, and rendering it more fitted for making statues, cannon, bells, &c. The name of *Native Bronze* has sometimes been given to minerals composed of tin and copper pyrites, and capable of yielding by fusion, a metal similar to bell metal.

Bronzite.—A native silicate of magnesia, occurring in massive aggregations of columnar crystals. The lustre is vitreous. It is found in Upper Styria, the Harz, &c., and in the lizard district of Cornwall.

Brora Coal.—Beds of poor coal lying in the midst of the oolitic deposits in the district of Brora, in the north of Scotland, and near Scarborough in Yorkshire. It has been conjectured that this coal is composed principally of the *Equisetaceæ*, or Horse tails.

Brosimum (βρωσιμος, eatable).—A genus of plants. See ARTOCARPACEÆ.

Brosmius.—A genus of malacopterygious fishes belonging to the family *Gadidæ*. Only one species has been found on the coasts of Great Britain, the torsk, *B. vulgaris*. It is considered to be the best fish for yielding cod liver oil.

Broussonetia.—A genus of plants belonging to the nat. ord. *Urticaceæ*. There is only one species in the genus, the paper mulberry, *B. papyrifera*, a native of Japan. It forms a small tree with soft, brittle, woolly branches; and large, hairy, rough leaves. The wood is soft, spongy, and of no value; but the Japanese and Chinese manufacture a kind of paper from the bark. It is called crape paper, and is prepared by being boiled in water till it is brought to a pulp. This is mixed with glue, and taken up with a mould of Bamboo-screen of the size required.

Brucea.—A genus of plants belonging to the nat. ord. *Rutaceæ*, and named after Bruce, the celebrated traveller. There are two species, both of which possess tonic and astringent properties, and have been used in cases of dysentery. *B. dysenterica* is a native of Abyssinia, and was for a time supposed to be the plant from which the false Angostura bark was obtained. This bark, however, is now known to be the *Nux vomica*, or the produce of an allied species of *Strychnos*. At the time it was imagined to be yielded by the *Brucea*, an alkaloid was procured from the false Angostura bark which was called, and still retains the name of, *Brucia*.

Bruchidæ.—A family of coleopterous insects belonging to the *Rhyncophora*. The perfect insects are met with only in flowers. They deposit

their eggs upon the young pod of leguminous plants, such as beans, pease, lentils, &c. The larvæ as soon as hatched penetrate into the substance of the grain. They there increase in size, feeding meanwhile upon the seed in the internal substance of which they lie concealed, the external envelope all the time continuing untouched. They remain all winter, and undergo there their transformations. When arrived at a perfect state, the insect makes its escape by gnawing a small round hole through the rind of the seed, the larva having previously eaten its way to the surface, so that a thin pellicle only remains. These insects are not very common in northern countries, but in more southern regions their ravages are at times incalculable. Upwards of 140 species have been described. *Bruchus pisi* is the best known for its depredations on pease, beans, &c. In North America its ravages were at one time so universal as to put an end in some places to the cultivation of these vegetables. *Bruchus granarius* is another species which is often very destructive to the same plants in this country. In tropical countries other species attack many other plants of the leguminous order, and some are even found in the cocoa nut. The species of *Anthribus*, which belong to this family, are not so destructive as those of *Bruchus*, but are larger, and more frequently found amongst old wood. Some of the species appear to be parasitic upon the *Cocci*. *Brachytarsus* (*Anthribus*) *varius*, which passes the winter in the pine forests of Germany, destroys the cocci in great numbers.

Brucite.—A species of magnesia. See MAGNESIA.

Bryaceæ.—A tribe of acrocarpous mosses, of which the genus *Bryum* is the type. The species of this genus are amongst the most numerous and widely spread of all the mosses. They grow in such abundance, that they resemble forests in miniature. They are always found on the ground, never in the water, nor on trees, and always in tufts. They are met with in all degrees of latitude in both hemispheres; in the bottom of valleys, and on the top of the highest mountains. *Bryum coronatum* grows in the warmest zones of the New World, *B. cæspititium* in Spitzbergen, and *B. argenteum* in the most diverse latitudes of both hemispheres, as Chili, Bolivia, Egypt, Canary Islands, Brazil, and Neel-Gherry hills. Upwards of fifty species are described, many of which are found in abundance in Great Britain. Several other genera belong to the tribe, of which the most particular are *Mnium*, and *Leptostomum*, and of these a good many species have been described.

Bryonia (βρυω, to vegetate).—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*. There are a good many species spread over the temperate and warm regions of the world. The wild bryony, *Bryonia dioica*, is common in the hedges in England, and was formerly held in much repute in rural pharmacy. The leaves in autumn have the smell of musk. It has a large fusiform succulent root, which possesses very strong drastic purgative qualities. The French call it the *Navet du Diable*, or devil's turnip. This purgative property depends upon the presence of a principle called *bryonine*. The fleshy root has been made to represent the human form, and has been shown to the common people as the root of the celebrated mandrake. It is composed principally of starch, and has a good deal of analogy with the root of the *jatropha manihot* of the West Indies, and a wholesome kind of cassava may be made from it as from that plant.

Bryophila (βρυον, lichen; φιλεω, to love).—A genus of nocturnal *Lepidoptera*, belonging to the family *Bombycidæ*. The species are small. Their caterpillars are furnished with tubercles surmounted with short hairs, and they live on lichens. They conceal themselves during the day, and undergo their transformations in holes, which they line with a kind of silk and cover with lichens, so as to conceal their retreat. Fourteen species have been described.

Bryophyllum (βρυω, to vegetate; φυλλον, a leaf).—A genus of dicotyledonous plants, belonging to the nat. ord. *Crassulaceæ*. The leaves of *B. calycinum* are remarkable for the property they possess of producing germinating buds from their edges if placed in a warm, damp, shady place.

Bryozoa (βρυον, moss; ζωα, animals), *Molluscan Zoophytes*.—See POLYZOA.

Bryum. A genus of mosses.—See BRYACEÆ.

Bubalus. *The Buffalo*.—See BOVEÆ.

Bubo. *The Owl genus*.—See STRIGIDÆ.

Bubroma (βους, an ox; βρωμα, food).—A genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*. *B. Guazuma* or bastard cedar, is a tree forty or fifty feet high, and is a native of both East and West Indies. In the latter country cattle are fed on its leaves and fruit in dry seasons when forage is scarce. The wood is light, and is wrought into coach panels. A decoction of the inner bark is said to be useful in curing elephantiasis.

Buccinum.—A genus of gasteropodous mollusca, belonging to the family *Buccinidæ*. A great many species, differing much from each other, have been described as belonging to this genus, but it is now so much restricted that there are only twenty recent species in reality belonging to it, though there are upwards of 100 fossil, chiefly found in the miocene formation. The common whelk or *Buckie*, *B. undatum*, is the largest of the species, and is very common on all the coasts of Great Britain. It is dredged for as an article of food, and its supply to the London market forms a considerable article of commerce. It has a wide range of habitat. It is found from low water mark to as great a depth as 100 fathoms, and extends throughout the Celtic, Boreal, and icy seas, along the coast of North America from Cape Cod to Greenland,

and finds its way through the Siberian Seas into the Sea of Ochotsk. It is found fossil in the newer Sicilian pliocene beds, but is not now met with recent in the Mediterranean.

Bucco (*bucca*, the cheek). *The Barbets.*—A genus of birds belonging to the order *Scansores*, and family *Picidæ*. They are distinguished by their large conical slightly compressed beak, which is swollen at the base and bearded with five tufts of stiff bristles. It appears to be especially fitted for cutting the stems of fruits as with a pair of scissors. Their feet are adapted for descending trunks of trees as well as ascending, having the claw of the reversed toe particularly hooked and sharp. These birds live in small societies during the year, except at the breeding season, when they are found in pairs. The female lays her eggs in holes of trees, or occasionally in one of the composite nests of the social grosbeaks. They are divided into two groups or sub-genera, the *Pogonias* (*Laimodon*) or barbicans, the species of which inhabit Africa and India, and feed on fruit; and the *Bucco*, restricted barbets, which equally inhabit both continents, and are generally adorned with vivid colours, but are of a heavy appearance.

Buceros (*βους*, an ox; *κερας*, a horn). *The Hornbill.*—A genus of birds belonging to the conirostral tribe of the order *Passeres*. The species are characterized by having their large hooked beak surmounted at the base by a horny appendage, nearly as big as the beak itself, and

Buceros rhinoceros—The Hornbill.

of a cellular structure within. They live upon both animals and vegetables, and inhabit the warm parts of Asia and Africa. They are difficult of approach, as they perch on the branches of high trees, where their vision can command an extensive range. Like the toucans, they swallow their food whole, throwing it first up in the air, and catching it as it falls. There are a good many species. The rhinoceros hornbill, *B. rhinoceros*, is about the size of a turkey, and of a blue-black colour. The horny appendage at the base of the bill is very large, in the form of a reverted horn. It is a native of Java, and hops along on both legs like a raven. It feeds chiefly on rats and mice. *B. Africanus* is a native of Africa, and is considered sacred by the negroes, who never destroy it, from a superstitious belief, that the death of one of them produces an attack of cattarh on the whole district. The pied hornbill, *B. monoceros*, is about the size of a raven, and nearly as black. The crest is thin, and frequently much injured from striking against the branches of trees, the bark of which the bird tries to detach for the purpose of getting at the insects which lurk beneath it. From its fondness for insects this species is carefully reared in Ceylon for the purpose of keeping the houses clear of vermin. It is a native of India, living among withered trees, in the holes of which they deposit their eggs. *B. undulatus*, the undulated hornbill, is the most beautiful of all the genus, as the bill is more proportionate to the size of the bird, and the colours have more variety and elegance. It is a native of Batavia.

Buddlea.—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, and named after Adam Buddle, a botanist of the time of Ray. There are about sixty species, all shrubs, and possessing showy, sweet-scented, and generally orange-coloured flowers. *B. Neemda*, a native of the Peninsula of India, is said to be one of the most beautiful plants of that country. Several species are cultivated in our gardens.

Buffonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Caryophyllaceæ*, and named after Count Buffon. The species are insignificant, slender plants resembling the *Arenariæ*. Linnæus, it is said, at the investigation of Sauvages, named a plant which the latter had discovered in Spain and the southern provinces of France, *Buffonia tenuifolia*. By omitting one *f*, it made it appear as if it were derived from *Bufo*, a toad; whilst the specific name *tenuifolia* was given to represent the *slender* claim Buffon had to be considered a botanist.

Bufo. *The Toad.*—See BATRACHIA.

Bufonidæ. *The Toad family.*—See BATRACHIA.

Bufonites.—The teeth of the fossil fish called GYRODUS.

Buhrstone.—A quartz rock, containing cellules. It is hard and firm, and has a rough surface, which qualities recommend it for use as an excellent millstone for grinding corn. The best stones for this purpose come from France,

and are found in the Paris basin and adjoining districts. Buhrstones are also found in several districts of North America, as Ohio, Georgia, and Arkansas.

Bulimina.—A genus of *Foraminifera.*—Twelve species of this pretty genus have been found recent in the Adriatic Sea. The fossil species are numerous.

Bulimus.—A genus of land shells belonging to the pulmoniferous tribe of the order *Gasteropoda*, and family *Helicidæ*. The animals of this genus respire air by means of lungs like the rest of the family. See HELICIDÆ. The shell is spiral, more or less elongated, oval, oblong or turriculated; and never orbicular as in the genus *Helix*. The species are exceedingly numerous, and are widely distributed, there being scarcely any part of the world where they are not found. They are most numerous, however, and of greatest size in hot climates. They can resist the action of drought for a length of time, shutting themselves up in their shells, and closing the mouth with a parchment-like secretion called an *epiphragm*. Some have been known to remain dormant for a considerable period of time; having been found alive after nearly a two years' sleep. Their eggs are very large, and are covered with a calcareous envelope. Many grow to a great size in hot climates, and possess bright and vivid colours; but those of Great Britain are all small and ordinary looking shells —a few are found fossil.

Bulla (*bulla*, a bubble).—A genus of shells. See BULLIDÆ.

Bullæa.—A genus of shells. See BULLIDÆ.

Bullidæ.—A family of tectibranchiate gasteropodous mollusca, the shells of which are always convolute, and more or less enveloped by the animal. The animals of this family are carnivorous, and are furnished with a gizzard armed with calcareous plates. Those of the genus *Bullæa* are very voracious. They prey chiefly on shell-fish, for which purpose their gizzard is provided with three calcareous plates, by means of which they can crack the shells after having swallowed them whole. The shell in this genus is entirely hidden in the substance of the mantle. More than 150 species of the family *Bullidæ* have been described, inhabiting all parts of the world, and some very widely diffused. All the species known to Linnæus were arranged under the genus *Bulla*, but now they have increased so much that it has been necessary to divide them into a good many genera. A species belonging to the genus scaphander, *S. lignarius*, is common on our coasts. The gizzard is testaceous, and has been described by Gioeni as a distinct genus of shells, to which he has had the modesty of giving his own name! Several species of Bullidæ have been found fossil in the tertiary strata.

Bunium.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*. Several species of this genus are described, amongst which *Bunium flexuosum*, the pig nut, is the best known. It is a native of the west and south of Europe, and plentiful in Great Britain, where it is also known by the name of earth nut. The root is nearly globular, has a sweet aromatic taste, and is frequently dug up and eaten by children. When boiled or roasted they are said to be little inferior to chestnuts, and on the continent they are often added to soup or broth. Pigs are very fond of them, and get fat when allowed to feed on them.

Buphaga (*βους*, an ox; *φαγω*, to eat). *The Beef Eater.*—A genus of birds belonging to the conirostral tribe of the order *Passeres*, and family *Sturnidæ*. The species of this genus live principally upon those parasitic insects the œstri or bot-flies, the larvæ or maggots of which are hatched under the skin of some of the larger ruminants, such as oxen, antelopes, camels, &c. These birds are natives of Southern Africa, and are seen in company following the herds of buffaloes and antelopes. They fix themselves upon the backs of these animals, and with their bill, which is fashioned like a pair of pincers, they dig and squeeze out the larva that lies festering under the tough hide of the quadruped. There are two species described, *B. Africana* and *B. erythrorhyncha*.

Buprestidæ.—A family of pentamerous *Coleoptera*, composed of some of the most splendid of the beetle tribes. Many of the species are decorated with highly brilliant metallic tints, polished gold upon an emerald ground, or azure upon a ground of gold. Their elytra are employed by the ladies of China, and even in our own country, for the purpose of embroidering their dresses. They vary much in form and size, some being only one line, while others are thirty-one in length. They creep slowly, but they fly swiftly in the hot sunshine. The majority of the species live in thick woods and forests, particularly of pine trees. They inhabit, for the most part, hot climates, the largest and most beautiful being found in intertropical countries. At the Cape of Good Hope a group is found having the elytra ornamented with tufts of white or yellow hairs, which give them a curious appearance. Upwards of 1,500 species have been described, and these are arranged in no fewer than forty-two genera.

Bursaria.—A genus of minute animals formerly believed to belong to the class *Infusoria*, but now ascertained to be the larva state of the genus *Planaria*. They are characterized by having the body ciliated all over. Locomotion, which is not lively, is effected by means of these cilia, which are usually arranged in longitudinal rows. Fourteen species have been described, most of them being found in stagnant fresh water, though some are inhabitants of the sea, and others have been detected in the intestines of the frog and the *nais*.

Butea.—A genus of dicotyledonous plants

belonging to the nat. ord. *Leguminosæ*, and named after the Earl of Bute, who was a great patron of botanists. The species are trees natives of the East Indies. *B. frondosa*, the dhak tree of India, an evergreen, is about fifteen feet high, and is found in the mountainous districts of Hindostan. From the inner bark, when an incision is made in it, a gummy blood-red juice exudes, which, when evaporated, is found to consist principally of tannin, and is brought into market under the name of East India Kino. An infusion of the flowers dyes cotton cloth a beautiful bright yellow. Gum lac is procured from this tree; the lac insects depositing small resinous lumps on the leaves of the smaller branches.

Buteo. *The Buzzard genus.*—See BUTEONINÆ.

Buteoninæ. *The Buzzards.*—A sub-family of birds belonging to the order *Accipitres* and family *Falconidæ*. This family of birds is characterized by the species having a moderate-sized bill hooked from the base, lengthened wings, the tail equal, and the tarsi of moderate size, and strong. Their large head has the space between the eye and nostrils bare of feathers but covered with hairs. In general the buzzards are sluggish birds, their body is heavy and their flight slow. They are natives of Europe, Asia, Africa, and America. The type of the family is the common buzzard, *Buteo vulgaris*, a bird measuring about twenty or twenty-two inches in length, and fifty in full expanse of wings, the female being the largest, and common in all the wooded countries of Europe south of Russia. It is found also in North America, in North Africa, and Madeira, and is not uncommon in Great Britain. The buzzard has a thick heavy body, is very sluggish and inactive, remains perched on the same bough for the greatest part of the day, and is always found near the same place, patiently waiting for its prey, which it pounces upon when on the ground. Its food consists of mice, frogs, moles, small birds, and reptiles, and even worms and insects. The female builds her nest in the fork of a tree, or takes possession of a deserted one belonging to some other bird. The young, contrary to the case of most others of the *Falconidæ*, remain with the parent some time after they quit the nest. Instances have occurred of domesticated buzzards hatching and bringing up the young of our domestic fowl. The rough-legged buzzard, *Archibuteo lagopus*, is another European species, and nearly allied to the last. Both these species have feeble sight in strong daylight, and are observed to seek their food in the evening; and in this particular, as well as in the softer and more downy texture of feathers, as compared with the rest of the *Falconidæ*, they approach somewhat to the owls. Several other species have been described, and one found in South Africa, *Buteo jackal*, derives its specific name from its peculiar cry, which is somewhat similar to that of the small quadrupeds called jackals at the Cape. The Dutch residents call it *Rotte-vanger*, or rat-killer, from its destroying such numbers of these vermin.

Buteo vulgaris—The Buzzard.

Butomus.—A genus of monocotyledonous plants belonging to the family *Butomaceæ*. *B. umbellatus*, the flowering rush, is considered the handsomest herbaceous plant of the British flora. It is a rush-like plant with umbels of fine rose coloured flowers. The root is considered in Russia as a specific in hydrophobia. Experiments made in this country have not, however, confirmed the accounts given of its virtues by the Russian physicians.

Buxus. *The Box Tree.*—A genus of trees and shrubs belonging to the nat. ord. *Euphorbiaceæ*. There are only two well ascertained species. The common boxwood, *B. sempervirens*, is a native of most parts of Europe, from Britain to Spain and Constantinople. It varies very much in size, growing, according to soil and climate, from three to fifteen or twenty feet high. The dwarf variety is extensively used in our gardens as an edging for borders and shrubberies. It was in equal request among the Romans; and the younger Pliny, in particular, mentions a pleasure ground at one of his country seats where his own name was shown in orderly cut box-tree shrubs. The large variety furnishes an excellent hard cross-grained wood, which for turning purposes is invaluable. It is the only wood used by engravers for making woodcuts. It is much used in France for various purposes. The value of the boxwood sent from Spain to Paris is reported to amount to about 10,000 francs a-year. The boxwood tree used to grow in great numbers at Boxhill, Surrey, and reached a large size. In 1815 the trees cut down there produced upwards of £10,000.

Byrsonima (*βυρσα*, a skin or hide).—A genus of dicotyledonous plants belonging to the nat. ord. *Malpighiaceæ*, and consisting of trees or shrubs which are natives of all the intertropical regions of America. The bark of some of the species, of which no fewer than seventy have been described, is extensively used for tanning in Brazil. The bark of *B. crassifolia*, which is called by the natives Chapera Manteca, is used in the cure of fevers, and has been vaunted as a remedy for the bite of rattlesnakes.

Byssaceæ (*βυσσος*, a thread).—A family of cryptogamic plants intermediate between lichens and algæ. The character is to have the thallus like that of an alga, and the fruit that of a lichen. The species are agamous vegetables, living most frequently in the atmospheric air, rarely in the water; or they are amphibious, living alternately in either medium. Many of the species referred to this family are of a very doubtful nature. See, for instance, the genus RHIZOMORPHA. *Racodium cellare* is a common plant in wine cellars, where it forms a kind of tapestry on the walls and roofs, investing the casks and bottles with a coating like the skin of a mouse.

Byssus (*βυσσος*, a thread).—Under this name is included that tuft of long, delicate, lustrous, and silky filaments which issues from the shell of certain acephalous mollusca, such as *Pinna, Malleus, Avicula, Tridacna, Mytilus*, &c., &c., and by means of which they are attached to submarine bodies. The animals of these shells are provided with a sort of contractile rudimentary foot, by means of which they spin a thread which is secreted by a particular gland. This foot also directs and fixes the byssus. The *Tridacna*, which is a large and ponderous shell, has a tendinous sort of byssus, whilst the *Pinna* and some others have one quite silky. Of this sort the inhabitants of Calabria and Sicily fabricate various stuffs of a golden-brown, much sought after for their softness and fineness. Gloves and stockings are the articles most frequently made, but the scarcity of the material prevents it being much used.

Byturus.—A genus of insects belonging to the pentamerous coleoptera and family *Dermestidæ*. The type of the genus is *B.* (*Dermestes*) *tomentosus*, the larvæ of which destroy the raspberry bushes in England, sometimes to a great extent.

Bytneriaceæ.—A nat. ord. of dicotyledonous plants, consisting of trees or shrubs, chiefly natives of hot climates. They contain the mucilaginous inert properties of the *Malvaceæ*; and many of the species, such as *Abroma microlæna*, and *Dombeya*, yield tough fibres well adapted for making cordage. The cocoa and chocolate of the shops are procured from a species of this family. See THEOBROMA. The fruit of *Guazuma ulmifolia* is eaten by the Brazilians.

C

Cacatua. *The White Cockatoo.*—See CACATUINÆ.

Cacatuinæ. *The Cockatoo family.*—A subfamily of birds belonging to the great family *Psittacidæ*. The species are characterized by their possessing a very strong, short, and much curved beak, and having the head ornamented with a tuft of feathers or crest, which they can raise or depress at pleasure. It embraces several genera. The genus *Cacatua*, or white cockatoo, contains various species distinguished by their being all more or less of a pure white colour, and by their having the crest very moveable and tinted with yellow or orange. They are natives of India and Australia. Leadbeter's cockatoo, *C. Leadbeteri*, is one of the prettiest of the genus, and forms our illustration. The genus *Calyptorrhynchus*, or black cockatoo, is composed of large species from New Holland, all of a black, or, at least, very sombre hue, but relieved by patches of a lively red or orange colour. Their crests are more simple and less moveable. These birds feed chiefly on bulbous roots and soft fruits, and live in small flocks in the forests, in the mountainous parts of Australia. They are said to be very wild, and all attempts to maintain them in captivity have hitherto failed. The genus *Callocephalon* or *Corydon* contains only one species, the *C. galeatum* of New Holland, of a black colour,

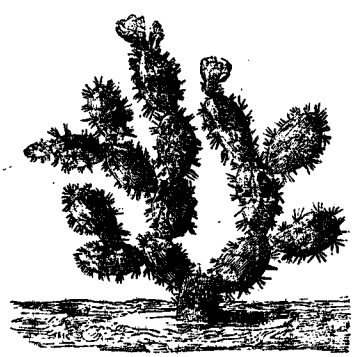
Cacatua Leadbeteri—Leadbeter's Cockatoo.

relieved by gray and dark olive, and remarkable for a vertical crest of fine drooping feathers,

which fall back in form of a plume. The genus *Psittrichas* or *Dasyptilus* differs from the others, in having the head and upper part of the neck naked. On the occiput the plumes are stiff and laid down. The white cockatoos are the only species brought to this country alive, and are the easiest tamed and most attached of all. They are remarkable for their singular antics and extraordinary gestures, constantly raising and depressing their crests, according as they are agitated by surprise, fear, or curiosity.

Cacicus.—A genus of birds. See CASSICUS.

Cactaceæ. *The Cactus* or *Indian Fig family.*—A nat. ord. of dicotyledonous plants, consisting of succulent shrubs, with peculiar angled, or deeply channelled, or sometimes flattened stems, having the woody matter developed in small proportion, and often arranged in wedges. These stems, though generally more or less elongated, are sometimes, as in the *Melocacti*, spherical, and they usually bear upon their surface little tubercles which, as the plant increases in age, fall away, and are succeeded by tufts of hairs or spines hooked backwards at the ends. The leaves are usually absent, but when present are fleshy, smooth, entire, or spinous. The flowers are sessile, and sometimes very showy. The species are almost all natives of the tropical parts of America. They principally occur in hot, dry, and exposed places, on rocks or plains where the common forms of vegetation could not exist, and some are very abundant on the lava in volcanic countries. The plants of this order are remarkable for the succulence of their stems, which are filled with an abundant, insipid, but wholesome fluid: and their fruit is succulent also, and in some species, as in the *Pereskias* or Barbadoes gooseberries, is edible, being considered superior to that of European gooseberries. In the fevers of the countries where they grow, they are freely administered as a cooling drink, and, when bruised, are considered valuable means of curing ulcers. When planted as a hedge, the cacti and opuntias form an impenetrable fence. The species of this family vary much in height, some having creeping stems which seem to crawl upon the ground among the dead branches of the surrounding trees, while others rear their deeply channelled leafless trunks above all the other vegetation around them to the height of thirty or forty feet. Sixteen genera have been described, and upwards of eight hundred species. They may be divided into four groups—the *Melocactus*, *Cereus*, *Opuntia* and *Pereskia*. The *Melocacti*, or melon thistles, are of a roundish form, resembling melons. They have no stems, branches, or leaves, and they grow close upon the ground, varying in height from a foot to a yard. The fruit of some of the species possesses an agreeable acid. The *Cerei*, or torch thistles, are either erect and standing by themselves, or creeping. Some rise to a considerable height, *C. peruvianus* reaching forty or fifty feet. They produce flowers of great beauty, those of *C. grandiflorus*, or the night-blowing cereus, being large and sweet scented, though they are of very short duration. They generally begin to open between seven and eight o'clock in the evening, are fully expanded by eleven or twelve, and before the morning are quite faded. The genus receives its name, *Cereus*, from a fancied resemblance to the stem of a wax-candle. The fruit of these is also edible. The *Opuntias*, Indian figs or prickly pears, are composed of articulated divisions, growing one upon another, and commonly compressed or flattened at the sides, which are beset with short spines. They are originally natives of the West Indies and South America, though now the *Opuntia vulgaris* is introduced into the south of Europe, and may be seen growing luxuriantly on the lava of Mount Etna. The fruit of this species is like a fig, of a deep red colour, and much esteemed as an article of food by the natives. It is upon



Opuntia cochenillifera—The Prickly Pear or Indian Fig. (From an original painting in the British Museum.)

some of the species of *Opuntia* that the cochineal insect feeds. The *O. Tuna* of Peru, *O. Hermandezii* of Mexico, and *O. cochenillifera*, are the principal species, and they are cultivated in what are called Nopaleries, for the sake of the insect. —See COCCUS. The *Pereskiæ*, or Barbadoes gooseberries, are furnished with true leaves, and differ from all the preceding species, as, besides leaves, they have stems and branches similar to those of other trees and shrubs. *P. aculeata* is an evergreen with a woody round stem, and white, very fragrant flowers. The fruit is globular, of a pale yellow, a little larger than the hazel nut, and pleasantly acid.

Cæcilia (*cæcus*, blind).—A genus of animals belonging to the class *Amphibia*, order *Batrachia*. The species were considered by Linnæus to be blind, hence the name he gave the genus. The eyes are exceedingly small, and nearly hidden under the skin. They are elongated, snake-like animals, destitute of limbs. They

have no distinct gills, or they only have them at a very early period of their lives. Several species are described, natives of South America, India, and Africa. They are said to be oviparous.

Cæomaceæ.—A family of minute *Fungi*, growing in the substance of living plants, and at last breaking out on the surface in patches. These plants are well known under the names of smut, brand, bunt, &c. The genera are numerous —ÆCIDIUM, PUCCINIA, and UREDO may be given as examples. See these words.

Cæsalpinieæ (after Cæsalpinus, the celebrated botanist).—A sub-order of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The flowers in this sub-order are irregular but not papilionaceous, and upwards of seven hundred species have been described. It embraces many genera, some of them containing plants valuable as medicines, dyes, and timber. The genus *Cæsalpinia*, which gives the name to the family, consists of trees or shrubs growing in the tropical parts of Asia, Africa, and America. Upwards of fifty species have been described. The Brazil wood of commerce, which furnishes a beautiful red dye, is procured from one or two species of this genus, though some uncertainty exists as to their identity. The best kind of Brazil wood is said to be obtained from Pernambuco, where it is called *Pao da Rainha*, or queen's wood, and where it is made a royal monopoly, its exportation, except on account of government, being prohibited under severe penalties. The two species which are said to produce it are *C. Braziliensis* and *echinata*. *C. Sappan*, commonly called Sappan wood, yields a fine red dye also, which is much used for cottons and woollens. It is a small tree, from ten to fifteen feet high, and is a native of the East Indies. The wood itself is used by cabinetmakers, and as it stands sea water, is employed for making treenails for ships. *C. mimosoides*, a native of Malabar, has leaves as sensitive and contractile as the sensitive plant itself. *C. Coriaria*, which grows in the salt marshes of Curaçoa and Carthagena, has peculiar curved pods, which are used by the Spaniards and natives for tanning leather. Of late this substance has become of commercial importance on account of the tannin and gallic acid it contains, and is known in the market by the name of *Dividivi* or *Libidibe*.

Caiman.—A genus of reptiles belonging to the alligators. See CROCODILIDÆ.

Cairina.—A genus of birds. See ANATINÆ.

Cajeput Oil.—The volatile oil obtained from the leaves of the *Melaleuca leucodendron* or *minor*. The tree is a native of the Molucca islands, is abundant in Amboyna, the inhabitants of which call it *Cayu-puti*, white wood. The trunk of the tree is black, but the branches are white, and the bark resembles that of the birch. The oil is obtained by distillation from the dried leaves. It is limpid, of a green colour, lighter than water, having a camphoraceous odour and a pungent taste. It is capable of dissolving caoutchouc. Cajeput oil is used medicinally as a stimulant and antispasmodic. During the attack of cholera in 1831, it was suddenly puffed up as a most efficient remedy in that disease; but it did not retain its reputation long.

Caladium.—A genus of plants. See ARACEÆ.

Calamintha.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*. This genus has been lately constituted to receive a few plants which formerly composed part of the genera *Thymus*, *Clinopodium*, and one or two others. There are four species common in Great Britain. The cat-mint, *C. nepeta*, has a strong aromatic smell, which cats are said to be very fond of—hence the name. It contains the volatile oil peculiar to the order to which it belongs, and an infusion of the leaves is recommended as a tonic and stimulant in flatulence and colic.

Calamites (*καλαμος*, the stem of a reed).—A genus of fossil plants, resembling the canes which belong to the genus *Calamus*. Their stalks are jointed, and they are now considered to be nearly related to the *Equisetaceæ*, or horse tails. They occur in the coal formations, and are the most common plants found there, so much so that it is probable they assisted materially in the formation of coal.

Calamus (*καλαμος*, a reed).—A genus of monocotyledonous plants belonging to the nat. ord. *Palmæ*, the palm tribe. This genus consists of a number of species of peculiar habit, growing in the tropical regions of the Old Continent. They have more the look of tall grasses than palms, so slender and flexible are their stems. Some of the species are very lofty, climbing over trees and bushes to a greater extent than any other known plants, and reaching to three, four, or even six hundred feet in length. *C. Rotang* and *C. Scipionum* are mentioned as the two species which produce the rattan canes of commerce, but it is probable that several species are cut indiscriminately. The best rattans are procured from Sumatra, Borneo, and the Malayan peninsula, and they form an extensive article of commerce, being exported in large quantities to Europe, Bengal, and China. In the latter country their consumption is immense, and the imports into this country are considerable. The average annual importation for the three years ending 1852 was 10,789,302. These canes are extensively used for the sake of their stems, which are coated with a hard flinty matter, and are easily split into strips, from which the bottoms of chairs and similar articles are manufactured. The inner part of the young shoots, stripped of the bark, is eaten either boiled or roasted on the hearth. The fruit is pleasantly acid. The resinous matter called dragon's blood of commerce, and used for colour-

ing, is the produce of the outer skin of the fruit of a species of this genus, *C. Draco*, a native of Sumatra and Borneo, from whence it is largely exported to India, China, and Europe. The best kind occurs in drops, and when purified and refined, as the Chinese have the art to do, it sells in Canton for from eighty to one hundred dollars per pecul, equal to 133 lbs. In the London market the best dragon's blood used to sell for from £21 to £25 per cwt., but in November, 1853 the price had fallen to from £5 to £15.

Calandra.—A genus of coleopterous insects belonging to the family *Curculionidæ*. The species are numerous, and in the larva state live at the expense of monocotyledonous plants, some in the stems and roots, others in the seed. The most remarkable of all, and famous for the ravages it commits upon the corn in our granaries, is the *C. granaria*, or corn weevil—a slender beetle of a pitchy-red colour, and about one-eighth of an inch in length. The larvæ are sometimes so numerous in a heap of stored wheat, and commit such ravages, that they leave nothing but the husks. Unfortunately, the mischief is generally unperceived till it is too late to remedy it. The female deposits her eggs upon the wheat after it is stored, and the young grubs hatched therefrom immediately burrow into the wheat, each individual occupying a single grain. There they undergo their transformations, and at the appointed time come out perfect beetles to lay their eggs for a second brood. The rice and Indian corn are destroyed in a similar manner, in the countries where these grains are cultivated, by another species of this destructive little weevil, the *C. oryzæ*. Kiln-drying the grain appears to be the only effective means of destroying these injurious pests. *C. palmarum* is one of the largest species of the genus, being nearly two inches long. The larva lives in the pith of the trunk of the palm trees, and undergoes its transformations there, forming a cocoon with the fibres which surround this pith. This same species, and another, *C. sacchari*, are equally destructive to the sugar cane in the West Indies. The natives of Guiana and Surinam consider these larvæ as great dainties, and eat them boiled. Many other species exist, all of them more or less destructive to the plants upon which they live.

Calanidæ.—A family of entomostracous crustacea. See COPEPODA.

Calappa. *Box Crab.*—A genus of brachyurous *Crustacea*, containing several species natives of the Indian Archipelago, the seas of Australia, the Pacific, Atlantic, and Mediterranean Oceans, &c. The front feet, or chelæ, are very large, and fit exactly to the external border of the shell or carapace, covering the mouth and anterior parts as with a shield. *C. granulata* is the best known species. It is an inhabitant of the Mediterranean Sea, and is known by the name of *coq-de-mer*. It lives concealed in the mud, and is found at a depth of ninety feet. When at rest, the feet are retracted within the hollow formed by the edges of the carapace, and the parts about the mouth being covered by the bread, flat, posterior feet, it looks like a box, and scarcely presents the least appearance of an animated being.

Calcareous Spar.—Carbonate of lime occurring in rhombohedral crystals and forming numerous varieties. When it occurs in transparent crystals, it is *Iceland spar*; when massive, each crystal being so imbedded in the mass as to lose all individuality, it is *Limestone* and *Marble*; when it is bituminous, it is *Stinkstone*; when earthy, *Chalk*; and when projecting from the roof or on the floor of caverns, &c., it is known as *Stalactite* and *Stalagmite*, &c., &c.

Calcarina.—A genus of animals belonging to the class *Foraminifera*. The shells of these animals are very pretty, being spiral, free, and rugose, and representing the form of the rowel of a spur. They are found living on the coral banks of the oceanic islands.

Calcedony.—See AGATE.

Calceola (*calceola*, a slipper).—A genus of fossil shells belonging to the class *Brachiopoda*, and family *Orthidæ*. The species occur in the palæozoic strata, and especially in the middle group. The typical species is *C. sandalina*, and is found in the Devonian and Eifel. The shell is inequivalve, triangular, with a flattish triangular area in the ventral valve, by which it probably was attached to other bodies.

Calceolaria (*calceola*, a slipper).—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*. The species are ornamental plants, with the corolla two lipped, the lower lip being larger than the upper, and inflated, so as to give a good deal of resemblance to a shoe or slipper. They are all South American, and in Chili and the mountainous parts of Peru they are so common as to give a peculiar appearance to the vegetation. Many species are cultivated in our greenhouses, and a number of hybrids and varieties of great beauty have been produced. Some of the species yield a dye.

Caledonite (from *Caledonia*, Scotland).—A mineral substance, lately described, composed of carbonate of lead (32 parts), carbonate of copper (11 parts), and sulphate of lead (55 parts), crystallizing in rhomboidal prisms. It occurs at the Leadhills, Lanarkshire.

Calendula.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Corymbiferæ*. The common marigold, *C. officinalis*, belongs to this genus. This plant, now so common in our gardens as to be almost indigenous, is originally a native of the south of Europe. It had formerly numerous virtues attributed to it, but is now known to possess no active properties. The flowers are used in some parts of the country to give a yellow colour to

cheese, and the petals are sometimes used to adulterate saffron.

Caligidæ (*caligo*, blindness).—A family of parasitic entomostracous *Crustacea*, belonging to the order *Siphonostoma*. The animals of the genus *Caligus*, as established by Müller, though all agree in living as parasites upon fishes and other aquatic animals, and having the organs of their mouth adapted for suction instead of mastication, present so many differences amongst themselves, that it has become necessary to separate them into various genera, and even into several families. In all, the mouth is provided with an apparatus, by means of which the little creatures can puncture the skin of their hosts, and suck up the nourishment derived from the juices of their bodies. They attach themselves to the fishes, upon which they are found, by a set of sharp pointed, hooked claws, called foot-jaws. In general they are not immovably fixed there, many of the species being able to move from one part of the body to another, and even from one fish to another. The eggs in the female are numerous, and are generally contained in long slender ovaries, which depend in a straight line from the abdomen. When first hatched, the young are very unlike their parent, and like those of the *Cyclopidæ*, which they resemble considerably in appearance, they undergo a series of changes in their progress to maturity. They are at first free and unattached, swimming freely in the water, and do not acquire their parasitic habits till after several moultings or changes of skin. Many of the species have their head in the form of a broad, flat buckler, while the thoracic and abdominal segments are uncovered. These form the restricted family *Caligidæ*, with the genus *Caligus* as the type, the species of which live on marine fishes, though in the case of the salmon they are capable of living for some time in fresh water also. Other species have a series of lamellar plates like the elytra, or wing cases of beetles, extending along the dorsal surface of the body. These form the family *Pandaridæ*, with the genus *Pandarus* as its type, when these plates are two or more in number; and the family *Cecropidæ*, with the genus *Cecrops* as the type, when only one plate exists. They are all parasitic upon marine fishes, and the fishermen commonly call them *fish-lice*.

Caligus.—See CALIGIDÆ.

Callæas.—A synonym of GLAUCOPIS, which see.

Callæatinæ.—A sub-family of birds. See CORVIDÆ.

Callianassa.—A genus of *Crustacea*. See MACROURA.

Callianira.—A curious genus of animals belonging to the class *Acalephæ*, and not far from *Beroe*. The animals are soft, gelatinous, wholly transparent and unattached, swimming freely in a vertical position. They are as yet, however, imperfectly known.

Callichthys (καλος, beautiful; ιχθυς, a fish).—A genus of malacopterygious fishes belonging to the family *Siluridæ*. The whole fish, with the exception of the snout and under surface of the body, is covered with large, hard, scaly plates. They are natives of South America and other hot countries, frequenting fresh water rivers and streams, which in these climates frequently during the hot season dry up. When this is the case, these fishes are said to leave these dried-up streams and travel over land some distance to other rivers. They can live for a considerable time out of water, and their structure appears to fit them for these habits.

Callidium (καλη, beautiful; ιδια, form).—A genus of coleopterous insects belonging to the family *Cerambycidæ*. Several species are known, living chiefly in fir timber, and deals. The larvæ of these beetles sometimes do much damage to timber which has been felled, and the bark of which has been allowed to remain on. They may be detected by the long cylindrical burrows which they form, and which are filled with excrement resembling powdered wood. They do not acquire their perfect form till after the lapse of two years, during which they change their skin several times. One species, *C. Bajulus*, is not uncommon in this country, and besides boring into fir trees, it has been found in London attacking the fir rafters of houses, to which they do much damage. The female deposits her eggs in holes made in the wood, the larvæ burrow into it, and there undergo their transformations. The perfect insects then escape by perforating the wood; and instances have occurred where they have actually made their exit by piercing the lead with which the house top was covered.

Callionymus. *The Dragonet.*—A genus of acanthopterygious fishes belonging to the family *Gobiidæ*. The gills have only a single small opening placed near the nape of the neck, and the vertical fins, larger than the pectoral, are placed under the throat. The gemmeous dragonet, or yellow skulpin, of Cornwall, *C. lyra*, is a handsome fish, about a foot in length, of a yellow colour, varying with blue and white, which gives it a beautiful appearance when in the water. It lives at the bottom of the sea, and feeds upon small shell-fish and worms. It is found in various parts of our coast, as well as in the Mediterranean, and on the coast of Norway. There are several other species; none of them possess the air bladder.

Calliphora. *The Meat Fly.*—See MUSCIDÆ.

Callistephus (καλος, beautiful; στεφος, a crown).—The genus of plants to which the China aster is now referred. See ASTER.

Callithamnion (καλος, beautiful; θαμνιον, a little shrub).—A genus of acotyledonous plants belonging to the nat. ord. *Algæ*. The species of this genus are generally of elegant forms and beautiful colours. They are of a delicate membranous consistence, attached to stones or rocks, the fronds variously ramified, and often prettily pinnated. They are found in all our seas, and

inhabit all latitudes, except extreme arctic or antarctic. About 110 species are described, two-thirds of which are European.

Callitris.—A genus of dicotyledonous plants belonging to the nat. ord: *Coniferæ*. *C. quadrivalvis* (= *Thuja articulata* of some botanists), the arar tree, a native of Barbary, supplies the resin called sandarach or pounce, used to strew over manuscripts, especially when erasures are made. The Turks consider the wood of this tree as indestructible, and use it in the construction of their mosques.

Callocephalon (καλος, beautiful; κεφαλον, head).—A genus of birds belonging to the cockatoo family. See CACATUINÆ.

Calluna (καλλυνω, to make beautiful).—A genus of plants to which the common ling or heather belongs. See ERICACEÆ.

Calocephalus.—A genus of seals. See PHOCIDÆ.

Calophyllum (καλος, beautiful; φυλλον, a leaf).—A genus of dicotyledonous plants belonging to the nat. ord. *Guttiferæ*. There are about a dozen species known, all trees, and natives of tropical countries. The leaves are very shiny, and remarkable for the beautiful manner in which they are veined. The flowers are generally white, in some sweet scented, numerous, and disposed in cymes or panicles. From the nuts of several species an oil is expressed, which is used for burning in lamps, and from the incised trunk a resin is obtained which is known in commerce by the name of Tacamahaca gum. *C. Inophyllum* is a native of India, attains a height of 90 or 100 feet, and frequently lives for 300 years. The Calaba tree, *C. Calaba*, a native of the Caribbee islands, grows to the height of sixty feet, and the wood is used for various purposes, especially for staves and cask headings.

Calosoma (καλος, beautiful; σωμα, body).—A genus of coleopterous insects belonging to the family *Carabidæ*, and nearly allied to the true carabi. About thirty species have been described, scattered over most parts of the globe. They are generally of a green colour, with a brassy hue, and are found chiefly on trees, where they prove of great use in destroying caterpillars injurious to vegetation. The best known species is the *C. sycophanta*, a common insect in France and Germany, and more rarely found in Great Britain. The oaks and pine forests of Germany are much infested with the caterpillars of various lepidopterous insects. In certain seasons they commit great ravages, and many hundred acres of the finest timber are thus often destroyed. The larvæ of the *Calosoma* are then exceedingly useful, as they are very voracious, and destroy thousands of these noxious insects. An inch and a half long, and armed with powerful jaws, they appear to be created for the very purpose of keeping them under. They are especially destructive to the gregarious processionary moths, the larvæ of which live in society, and form a common cocoon under which they undergo their transformations. Into these nests the larvæ of the *Calosoma* insinuate themselves, and fatten upon the bodies of their victims, till the segments of the abdomen become so distended that they are unable to move.

Calothrix (καλος, beautiful; θριξ, a hair).—A genus of acotyledonous plants belonging to the nat. ord. *Algæ*, and tribe *Oscillatoreæ*. The species of this genus are membranous filamentous plants growing in tufts of varied colours, chiefly green and rather elegant in appearance, on stones and stems of aquatic plants under water. They are found in both fresh and salt water. About fifteen species are known.

Calotragus (καλος, beautiful; τραγος, a goat).—A genus of antelopes. See ANTILOPEÆ.

Calotropis (καλος, beautiful; τροπις, a keel).—A genus of plants. See ASCLEPIADACEÆ.

Caltha.—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*. It contains about twenty species, spread over the shady and marshy places of Europe and North America. The typical species, *C. palustris*, the marsh marigold or yellow gowan, is one which is common throughout most of Europe, and is easily recognized by its fine large yellow flowers, and deep green shining leaves. Like the rest of the nat. ord. to which it belongs, it possesses an acrid principle which even vesicates. It has been used as an antiscorbutic and purgative, though now it is never employed. In America it is used as a pot herb in spring when coming into flower, and in the north of Europe its buds pickled in vinegar have been recommended as a substitute for capers. Goats and sheep are the only animals that will eat this plant, and even these not without reluctance.

Calycanthaceæ.—A nat. ord. of dicotyledonous plants allied to the *Rosaceæ*. The species are aromatic shrubs, growing in North America and Japan. Their stems are square, with a central woody mass and four smaller ones around it. There are only two genera belonging to the family *Calycanthus* and *Chimonanthus*. The species of *Calycanthus* are all natives of North America, but are cultivated in our gardens, and flower in spring. The flowers are purple and exhale a sweet odour, and the bark of some is used as a carminative. *C. floridus* is called American allspice, and was named by Buchoz *Pompadoura*, after the famous Madame de Pompadour. The *Chimonanthus* is a native of Japan, and contains only one species, *C. fragrans*, or Japan allspice, a plant with deliciously fragrant lemon coloured flowers, appearing in the winter after the fall of its leaves.

Calycanthus.—See CALYCANTHACEÆ.

Calymene.—A genus of extinct fossil *Crustacea*. See TRILOBITA.

Calyptorhynchus.—A genus of cockatoos. See CACATUINÆ.

Calyptra (καλυπτρον, a hood).—An organ in

plants connected with the parts of fructification. In some flowering plants it covers over the flower, as in *Pileanthus*; in others it forms a lid to the stamens, as in *Eucalyptus* and *Eudesmia*. It is more peculiarly applied, however, to cryptogamic plants. In the *Hepaticæ* it exists in the form of a cup or wrapper at the base of the fruit stalk, and tears at the summit to allow the capsule to pass through. In *mosses* it tears circularly at the base, and is raised and carried up by the capsule which it continues to cover till the spores ripen.

Calyptræidæ. *Bonnet* or *Chambered Limpets.*—A family of molluscous animals belonging to the class *Gasteropoda*. This family contains numerous species which are all marine, of a trochiform or patelloid shape, and the greater number possessing a shelly plate at the bottom of the cavity, to which the adductor muscles of the animal are attached. They are found adhering to stones and shells, most of them probably never moving far from the spot on which they first settle. Their form, consequently, varies much according to the situation in which they grow. They are supposed to be vegetable feeders, or to feed upon animalcules. Of the genus *Calyptræa*, or cup and saucer limpet, fifty recent species are known, living under stones between tide marks, and in shallow water, and very widely distributed over the greater part of the globe. Thirty fossil species have been described from the chalk. Of the genus *Crepidula*, or *slipper shell*, forty recent species are known, distributed over all the warmer regions of the earth, and being sedentary on stones and shells in shallow water. They are frequently found adhering to one another in groups of many successive generations. Fourteen fossil species have been described from the eocene. The genus *Hipponyx* consists of small shells, attached, and forming a shelly base, with a horse shoe shaped impression upon it. They have no internal shelly plate. The shells of *Capulus* or *Pileopsis*, the fool's cap limpet, agree with them in this respect, and have a horse shoe shaped muscular impression within the shell. They are attached to rocks and oyster shells, &c. Seven recent and twenty fossil species have been described.

Calystegia (*καλυξ*, calyx; *στεγη*, covering.)—A genus of dicotyledonous plants formerly included in the genus convolvulus, and belonging to the nat. ord. *Convolvulaceæ*. About twenty species have been described, natives of the temperate parts of Europe, Asia, and America, all herbaceous, lactescent, and climbing. Our wild convolvulus of the hedges, or great bindweed, *Convolvulus Sepium* of most botanists, may be taken as the type. This plant, with its trailing and twining stem, adorns our hedges in summer, and is common throughout Europe. The expressed juice of the root is purgative, and forms a preparation called false or German scammony.

Calyx.—The *outer* envelope of the flower, consisting of leaves called *sepals* arranged in a whirl around the corolla, in those plants which have a double perianth, or which are called complete flowers; the *only* envelope in those in which the perianth is simple. When the sepals are separate, the calyx is called *polysepalous*, when they are soldered together it is called *gamosepalous*, or *monosepalous*. Occasionally, as in the compound flowers (*compositæ*), it is developed in the form of hairs or feathery divisions, and is then called *pappus*. The office of the calyx, when the perianth is double, is to protect the tender parts that are formed within it; when the perianth is single, and the sepals are coloured, it no doubt performs the part of a corolla; and when it is in the form of *pappus*, it seems intended as a means of transporting the seeds to a distance.

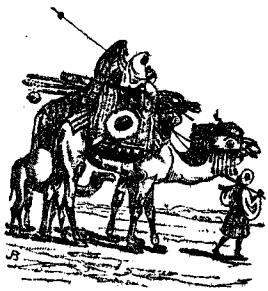
Cambium (*cambio*, to change).—In spring, when the sap of plants is in motion, there may be seen between the bark and the wood, if they are gently separated, an apparently mucilaginous liquid, which seems at the same time both to unite and separate the bark from the wood. This liquid has been called *Cambium* by the early botanists, and the part which it plays in the phenomena of vegetation is most important. In a short time this *Cambium* changes its mucilaginous appearance, and becomes a cellular tissue, which ultimately becomes thickened pleurenchyma. It is from this generative tissue, in fact, that all the succeeding layers of wood are developed. In most dicotyledonous plants, the cambium is gradually matured into wood from within outwards, but in the monocotyledonous, and flowerless cormophytes, it often remains in great part in a delicate and soft condition, forming what are called the proper vessels.

Camelina.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and consisting of herbaceous plants with small yellow flowers. The *C. sativa*, or gold of pleasure, is a native of this country and the continent of Europe, and in France is cultivated for its seeds, from which an excellent oil is obtained.

Camellia.—A genus of dicotyledonous plants belonging to the nat. ord. *Ternstræmiaceæ*, or tea family, and called after Father Camelli, or Kamel, the Jesuit. It contains ten or twelve species, which are peculiar to Southern Asia. They are lofty evergreen shrubs, with large, beautiful flowers, varying from white to red, and rose colour. The principal species is the *C. Japonica*, a native of Japan, and introduced by Camelli into Europe, in 1739. For many years this handsome plant was only found in the gardens of the curious or scientific botanist. Now it is cultivated throughout Europe with as great ardour as the rose or dahlia. Numerous varieties have been produced, and at the present day, not fewer, it is said, than 1,500 are known. The trade in camellias is one of very considerable importance in Europe and North America. *C. Sasanqua*, the Sasanqua tea, is a native of China, and produces snow-white flowers. The leaves when dried have

a sweet smell, and are mixed with tea to give it a grateful odour. The Chinese women use a decoction to wash their hair with. From the nut is expressed an oil which is considered equal to the best which comes from Florence. *C. oleifera* yields also a valuable oil much esteemed in China.

Camelus. *The Camel.*—A genus of ruminating animals belonging to the family *Bovidæ* and tribe *Camelina*. This genus contains two species, the common camel and the dromedary—both of them animals of very great importance to man. The common camel, *C. Bactrianus*, is said



Camelus Bactrianus—Bactrian camel.

to be a native of the Mongolian deserts, but is domesticated in Eastern Europe, Persia, Tartary, and India. It appears to have been domesticated from the earliest ages, and is only known in that state. It is distinguished by having two humps on the back. The dromedary, *C. dromedarius*,

Camelus dromedarius—Dromedary.

has only one hump on the back, and is not so stout and muscular as the camel. Its native country is the deserts of Arabia, and it is domesticated in Africa and India. There are two varieties of the dromedary, one strong and slow, used for carrying burdens, &c., the other slighter and fleeter and used for travelling. Camels have no horns, and have incisor teeth in the upper jaw, two characters which distinguish them from the other tribes of the family *Bovidæ*. They have a broad, expanded, elastic foot, terminated in front by two comparatively small hoofs or toes, fitting the animal for travelling over the deserts without sinking into the sand; and to enable them to endure the want of water in these arid regions where wells or springs are scarce, the stomach is provided with a cellular structure or an assemblage of cells, which are capable of being converted into as many water tanks, in which water can be retained for a considerable length of time while on a journey. They fold their feet under their body when they rest, with their chest on the earth, hence the knees and chest are generally callous. The Arabians emphatically call the camel, *the Ship of the Desert*, as by means of it, the most dreary wastes are traversed, and the nations which these disjoin are enabled to trade with one another. They regard it as a gift of heaven, without whose aid they could neither subsist, nor trade, nor travel. Its milk is their ordinary food, they also eat its flesh, especially when young; its hair is partly manufactured into stuffs for their clothes, tents, and furniture, and partly sent abroad as a valuable article of merchandise; and even its dung serves them for fuel. The hair of the camel imported into this country is principally used in the manufacture of fine pencils for drawing and painting. The French use it in the manufacture of hats. The most esteemed hair comes from Persia, but considerable quantities are exported from Smyrna, Constantinople, and Alexandria.—A fossil species of camel, *C. Sivalensis*, has been discovered in the tertiary deposits of the Sewalik hills of Hindostan. It appears nearly related to the existing recent species, but exceeds them about one-seventh in height.

Campanula.—See CAMPANULACEÆ.

Campanulaceæ. *The Hare-bell family.*—A nat. ord. of dicotyledonous plants, containing many well known and beautiful flowers, natives for the most part of temperate climates. They are generally herbaceous, rarely shrubby, and abound in a milky juice. Many genera belong to this family, and 800 species have been described. The general form is that of the *Campanula*, or bell flower, which gives the name to the family. Of this genus not fewer than 182 species have been enumerated, the general colour of the flowers being blue. They are chiefly natives of the mountainous districts of the temperate climes of Europe and about forty are cultivated in our gardens. They are general favourites from their fine, beautifully coloured, and elegant flowers, but few are of much use to man. The roots of two or three species, *C. rapunculus*, or rampion, *C. persicifolia*, and *C. rapunculoides*, are eaten boiled tender, and served up hot with sauce, or cold with vinegar and pepper. The young shoots are used on the continent as salads. *C. pyramidalis* has long been a great favourite in our gardens, and is in great demand in Holland, where it is employed to ornament halls and staircases, and to place before fire-places in summer. Many of the species were formerly considered to

have great efficacy in the cure of disorders of the neck and trachea—hence the names *Trachelium*, *Cervicaria*, and our English *Throat-wort*. *C. rotundifolia* is the hare-bell, or blue-bell of Scotland. The juice of the flowers is stated to make a very good blue ink, and when mixed with alum a green one.

Campanularia, Campanularidæ. — A genus and family of zoophytes. See ANTHOZOA.

Campephilus. — A genus of woodpeckers. See PICIDÆ.

Camphora. — A genus of dicotyledonous plants belonging to the nat. ord. *Lauraceæ*, or the laurel family, and yielding the camphor of commerce. The camphor tree, *C. officinarum*, the *Laurus camphora* of older botanists, is a tree with lax smooth branches and bright green leaves. It is a native of China and Japan, and is cultivated in most of the warmer parts of the world. The camphor is obtained by boiling the timber. The tree is extensively cultivated in the island of Formosa, and the camphor is taken to Canton, which is the principal port for exportation. The exports from China, taking the average of the years 1830 and 1831, may be reckoned at about 400,000 lbs. annually. A small portion comes from Japan by way of Batavia, amounting to about 66,000 lbs. annually. There is another kind of camphor produced from a tree which grows in Sumatra, Borneo, and the Malayan peninsula, the *Dryobalanops camphora*, or *aromatica*, and known by the name of Sumatra or Malay camphor. It is secreted naturally in crystalline masses, and lodged in cavities in the wood, and is in great request among the Chinese, by whom it is almost entirely consumed. In Canton, when the common camphor is quoted at thirty dollars per *pecul*, the Malay camphor will fetch thirty dollars per *catty*, being rather more than 100 times dearer. In consequence, it is almost totally unknown in Europe.

Canarium.—A genus of dicotyledonous plants belonging to the nat. ord. *Amyridaceæ*. This genus contains several lofty trees which exude a resin or balsam. In one species it has the same qualities as the balsam of copaiva, and in another it resembles copal, and is used to varnish household furniture. The substance called *Damar*, or *Dammar*, in the East Indies, and used for caulking ships, is composed of this resin mixed with the bark of bamboo reduced to powder, and a little chalk. The fruit of *C. commune* is eaten in Java both raw and dressed, and an oil is expressed from it, which, when fresh, is eaten at table, and when stale, is used for burning in lamps.

Cancer. *The Crab.*—A genus of decapodous short-tailed *Crustacea*, belonging to the family *Cyclometopa*. See BRACHYURA. Linnæus arranged all the crustacea belonging to the *Decapoda Brachyura*, under the general name of cancer. Recent zoologists have restricted the genus within narrow limits, so as to contain only a few species. The common large edible crab, *C. pagurus*, is the best known of these, though even this is removed by some to a separate genus, *Platycarcinus*. The carapace is large, rounded in front, narrowed posteriorly, and the dorsal surface is granulated. Its colour is reddish-brown, but the hands or claws are smooth and black. Of all the short-tailed crustacea, the crab is the most esteemed as an article of food, and the fishery constitutes an important trade on many parts of our coast. It inhabits the whole of the shores of Great Britain, especially those parts which are rocky, and the numbers annually taken are immense. They are caught in wicker traps called "crab-pots," made of the twigs of the golden willow, and formed on the principle of a common wire mouse-trap, baited with pieces of fish. Their food consists of dead animal matter. The females are impregnated almost immediately after shedding their shell. The spawn is carried by them for a considerable time and deposited at intervals during the spring and summer. When the young are first hatched, they are very unlike the parent, and were till lately considered as a distinct genus, and described under the name of *Zoea*. Several species of zoea have been enumerated, which are either the young of different species of cancer, or only different stages of growth of these young crabs.

Cancroma. *The Boat-bill.* — A genus of birds belonging to the order *Grallæ*, family *Ardeidæ*, and sub-family *Ardeinæ*. The best known, perhaps the only, species of this genus is the common boat-bill, *C. cochlearia*, a bird about the size of a fowl, and remarkable for the form of its bill. It has been described as resembling two spoons joined at their edges, hence the specific name. It has also the appearance of a boat with the keel turned upwards, from which circumstance it obtains its English name. It inhabits South America, and is especially common in the marshy parts of Guiana, perching on the trees which overhang the water, and darting down ever and anon to seize fish, and perhaps crustacea.

Canella.—A genus of dicotyledonous plants belonging to the nat. ord. *Meliaceæ*. The only species described is the *C. alba*, a tree from ten to fifty feet high, a native of South America and the West Indies, and from which is obtained the spice called *Canella bark*. The entire tree is aromatic, and when in blossom, perfumes the whole neighbourhood. The berries have a faint aromatic smell and taste, and are greedily eaten by the white-bellied and bald pate pigeons (*Columba Jamaicensis* and *leucocephala*), which acquire from them that peculiar flavour which is so admired. The inner bark is an article of commerce, and is brought to this country in long pieces, some rolled in quills like cinnamon, but considerably thicker, others flat, about one-fourth of an inch in thickness. The odour, when fresh broken, is aromatic, something like that of a mixture of cloves and cinnamon, and the taste slightly bitter and extremely warm and pungent.

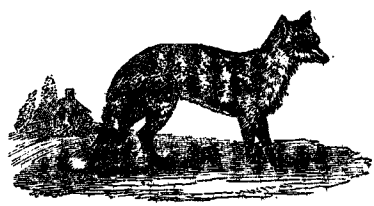
It is employed by the negroes in the West Indies to flavour their "meagre pot," and in this country is used merely as an aromatic and slightly bitter tonic.

Canina. *The Dog tribe.*—A tribe of animals belonging to the class *Mammalia*, order *Ferœ*, and family *Felidæ*. In this tribe of animals are included the dogs, wolves, jackals, and foxes. The varieties of the dog are numerous and mostly well defined. Linnæus included them all under the single species *Canis familiaris*, or domestic dog. The dog, it has been well said, "is the most useful conquest man has made." It is the only animal that has followed him over all the earth. He is emphatically, amongst the lower animals, "the friend and companion of man." At least this is the case in Europe, though it is not so to the same extent in the East. Mohammedans and Hindoos regard the dog as impure, and will not touch it without an ablution. From the Hellespont to the confines of Cochin China, dogs are unappropriated, and have no master. They prowl about the towns and villages; and though they are naturally more familiar, they are in no respect more domesticated than the carrion crows, kites, vultures, &c., which assist them in performing the functions of scavengers. In China and Cochin China the dog is eaten as food. It is a question that has been discussed with con-

1. Esquimaux Dog. 2. *Canis Dingo*, the Dingo of Australia. 3. Mexican Lap-dog. 4. *Cuon primævus*, the Buansuah.

siderable eagerness,—what is the parent stock of the dog? Some regard it as derived from the wolf; others from the jackal. In one thing, however, all agree, no trace of the breed is to be found in a primitive state of nature; and where dogs have been found apparently wild they have never shown any tendency to return to the true form of either the wolf or the jackal. From the earliest periods of which we have any records the dog appears to have been always domesticated. Dr. Morton has lately shown that ten species or varieties are easily recognizable in the early monumental inscriptions of Egypt and Etruria. The fox dog, "Canis Inpaster" *Ehrenberg*, appears to be the oldest dog of which the Egyptians have left any effigy. It represents a symbol in their alphabet, and must therefore be upwards of 4,000 years old. It is found represented in the paintings of the tomb of Roti at Beni Hassan, in the twelfth dynasty, or twenty-three centuries before Christ, and can be traced down through successive monumental periods till they cease. It is found embalmed in great numbers in various parts of the country, and appears to be the parent of the red wild dog so common at Cairo and other towns of the lower country, which now leads a nomadic life. The greyhound, *C. graius*, is also represented in some early Egyptian monuments. It occurs first in paintings on a tomb of the fourth dynasty, which are upwards of 4,000 years old. The bloodhound, *C. sagax*, the turnspit, *C. vertagus*, and the watch-dog, are all recognizable as represented on the tomb of Roti at Beni Hassan; and the house dog, *C. hybridus*, the wolf dog, *C. pomeranius*, and the bull dog, *C. molassus*, are figured on the monuments of the twelfth dynasty. The mastiff, *C. laniarius*, is figured on two Greek medals of the fourth or fifth century

before Christ; and a magnificent specimen is sculptured on one of the Babylonian marbles lately brought to this country by Layard, taken from the Birs-nimroud, of the time of Nebuchadnezzar; and the shepherd's dog, *C. domesticus*, is seen on some ancient Etruscan medals of unknown date.—The varieties of the dog are very numerous in Europe, arising from domestication and breeding. In India there are several in a more or less wild state. One of these is the Thibet mastiff, a few specimens of which have occasionally been brought to this country, and which is almost exactly similar to that of Birs-nimroud. In the Deccan, a species is found called the wild dog of the Deccan or Dukhun, the Kolsun of the Mahrattas, *Cuon Dukhunensis*, which differs from all the European species or varieties, and has no resemblance to the jackal, the fox, or the wolf. The wild dog of Nepâl, and the Buansuah, *Cuon primævus*, are varieties of this kind, as are also the Brinjaree and the Pariah dogs of India which are so numerous, breeding in the towns and villages unmolested. The Dingo or Australian dog, *Canis Dingo*, is another peculiar species found in Australia, and of a very savage nature. It bears a considerable resemblance to the wolf, and is very eager after its prey. The dog has been found in a fossil state. Skulls and other bones have been obtained from some bone caves near Liège, and in New Zealand they have been found associated with bones of the Dinornis. The wolf, *Canis lupus*, was at one time a native of Great Britain, but has long been extirpated. The Saxon name for the month of January, *Wolfmoneth*, would seem to show that it was at an early period of our history exceedingly common, and perhaps at that season of the year very fierce and destructive. It now infests the western countries of Europe. A species of wolf is represented along with the dog in Egyptian monuments, and figured on the tombs of the fourth dynasty, about 4,000 years old. In the northern parts it becomes white in winter. The wolf is a cruel cowardly creature, preying upon animals which he can pounce upon unawares, and when pressed by hunger will even attack man. There are several other species of wolves described. The most abundant is the American wolf, *Canis (lupus) occidentalis*, which is very common throughout the northern regions of America, and more or less numerous in other districts of the same country. They hang in bands on the skirts of the buffalo herds, and prey upon the sick and straggling calves. They also attack deer, foxes, and dogs. Several varieties of this species are mentioned. The prairie wolf, *Canis latrans*, is another American species, living and bringing forth its young in burrows in the open plains. It extends from about the 55th degree of north latitude southwards to Mexico. It hunts in packs, and is much fleeter than the common wolf. One or two other species occur in South America. The Landgah or Indian wolf is a native of Nepâl. The jackal, *Canis aureus*, is a native of India, and is very abundant. They are gregarious animals, and hunt in packs, making smaller mammalia and poultry their prey. They burrow in the earth, and sally forth at night to seek their food. They frequent the neighbourhood of large towns, and act as scavengers. Their cry is peculiarly disagreeable, and is very startling to the European on his arrival in India. Heard for the first time in the dead of night, and close to the place where the stranger is sleeping, the unearthly long protracted screaming is quite appalling, and can never be forgotten. The jackal is a native of Syria also, and as it is found in considerable abundance in the neighbourhood of Gaza, it is supposed by many that the 300 *foxes* used by Samson to destroy the crops of the Philistines (Judges xv. 4, 5) were in reality *jackals*. The Hebrew word "shual," used by the sacred writer, approaches so near to the modern oriental name of this latter animal, "chical" of the Turks, "shacal" of the Persians, that it gives considerable strength to this opinion. The fox, *Vulpes vulgaris*, the *Canis vulpes* of older



Vulpes vulgaris.—The Fox.

zoologists, is a native of most parts of Europe, the north of Asia, and America. It is famed for its cunning and sagacity, is very destructive to game and poultry, and is remarkable for its fœtid odour. It is a common resident of Great Britain, and affords great diversion to the huntsman. The fox occasionally eats berries and fruit, and in those countries where there are vineyards does an immense deal of mischief to the crop of grapes. The arctic fox, *Vulpes Lagopus*, is a very pretty species, inhabits the countries bordering on the Frozen Ocean, and is killed in great numbers for its fine white fur. The black or silvery fox, *Vulpes argenteus*, inhabits the northern parts of Asia, Europe, and America, and is distinguished by its rich fur, which is more valuable than that of any other quadruped. Several other species are known.

Canna.—A genus of monocotyledonous plants belonging to the nat. ord. *Marantaceæ*, or *Cannaceæ*. There are several species, natives of South America and India, and known by the name of *Indian shot*. From *Canna Indica* we derive most of our walking canes. The leaves are large, and in Cayenne they are used to cover houses, and in Brazil they are chosen to form envelopes for articles

of commerce. The seeds are small, round, black, shining, hard, and heavy, and are sometimes used as a substitute for shot. When roasted they are used as coffee, and yield a beautiful, but not lasting, purple dye. *Canna edulis* has large tuberous roots which contain a great quantity of starch, and yield arrowroot. The substance called *tous les mois* is procured from this and one or two other species.

Cannabinaceæ. *The Hemp tribe.*—A nat. ord. of dicotyledonous plants, by some botanists considered a sub-order of the *Urticaceæ* or nettle family. It contains two genera, amongst the species of which are two well-known and valuable plants, the hemp and the hop. Hemp is the produce of *Cannabis sativa*, a plant which resembles in general appearance the common nettle, and appears to be a native of Northern India and the north-eastern parts of Europe, though now distributed over the greater part of Europe, and almost naturalized in the south of France, Italy, &c. The tough woody fibre of which the stems of this plant consist, yield when properly prepared, that extremely valuable article from which our linen cloth and cordage are manufactured. From the seeds a useful oil is extracted; and they are recommended for feeding poultry, and are said to cause hens to lay a larger number of eggs. Hemp contains a powerful narcotic principle, which is well known to the natives of India. This principle is more highly developed in hot than in temperate climates, and the natives of the East compound a beverage from the leaves and bark which has an intoxicating quality. When the dried leaves are mixed with tobacco and smoked, a more powerful effect is produced. An extract is prepared from the variety *indica* which is called bhang in India, and is used medicinally as an antispasmodic and anodyne in cases of tetanus and neuralgia. It is also called gunja or ganga, and Haschisch. English hemp when properly prepared is said to be stronger than that of any other country. Hitherto, comparatively speaking very little has been cultivated in this country, though of late more attention has been paid to the subject, especially in Ireland. The greatest quantity imported into Great Britain is from Russia. In 1832, about 29,135 tons were imported from St. Petersburg. The quantity imported to Great Britain from all countries, in 1851, amounted to 1,301,488 cwts., equal to 65,024 tons. The hop is the produce of *Humulus lupulus*, a twining plant, which is a native of most parts of Europe, and grows wild in England. When cultivated and supported on poles or trees it will reach the height of from twelve to twenty feet or more. The portion of the plant used is the strobilus, or spike of female flowers, and the bitterness for which it is remarkable resides in the resinous glandular scales surrounding the fruit. These are called lupulinic glands, and the principle itself is called lupulin. The chief value of hops is in the brewing of beer and ale; but, independently of that, they are used medicinally as a tonic and narcotic. A pillow stuffed with hops is frequently recommended in cases where there is great want of sleep. The use of hops in the manufacture of ale and beer is imported to us from Germany, and the culture of the hop in Britain was introduced from Flanders in the reign of Henry VIII. A duty is laid on all hops produced in this country, and the amount collected from this forms a very large source of revenue to Government. It varies, of course, according to the harvest. In 1842, this duty produced £260,978 18s. 10¾d. The land in Eng. and under hops comprises 52,000 acres.

Cannabis.—See CANNABINACEÆ.

Cantharidæ.—A family of insects belonging to the *Heteromerous Coleoptera* and tribe *Trachelia*. The insects of this family are distinguished by the head being dilated behind the eyes, and then suddenly narrowed into a short neck. The species are numerous, much variegated in colours, of a moderate size, and mostly living on vegetable substances. They counterfeit death when alarmed, and many of them at such times emit a thick yellowish fluid from the articulations of the legs, &c., of an unpleasant odour. Many species possess strong vesicating powers, and are employed externally in medicine to produce blisters, and internally as a powerful stimulant. The genus *Cantharis* contains many species which have this quality, natives of Europe, America, India, &c. *C. vesicatoria* or common *Cantharis* is the blister fly of our shops. It is of a beautiful brilliant sericeous green colour, with black antennæ, an elongated cylindrical body, and a large heart-shaped head. It is found in great abundance in the south-western parts of Europe, appearing in the months of May and June, and living upon the ash, privet, syringa, lilac, &c. Occasionally it makes its appearance in England, but not often. The presence of these insects is made known to those who collect them by the disagreeable odour they exhale, resembling that of mice. They are very susceptible of cold, and become benumbed even by the ordinary low temperature of the night. It is thus easy to collect them, and as they live in society, great numbers are taken. A white sheet is spread early in the morning at the foot of the tree upon which they are found, and the branches smartly shaken. They fall on to the sheet without attempting to fly away, and the sheet with its contents is then plunged into vinegar and water. When dead they are dried in a granary, or under an airy cart-shed, and afterwards packed in boxes hermetically sealed, in which they may be kept for a length of time. Our principal supply of these insects is from Spain, hence their common name *Spanish flies*. The larvæ of the *Cantharides* are said to reside under ground, and feed upon vegetables. The *Can-*

tharis vittata or striped cantharis is a native of North America, and feeds chiefly upon the stem of the potato, to which crop it does immense damage. It is there called, in consequence, the *potato fly*. There are numerous other species belonging to the genus, and all appear to possess similar vesicating powers to the official one. This peculiar principle is called *Cantharidine*. The genus *Mylabris* contains several species, which are also gifted with the same quality. Two species, *Mylabris cichorii*, a native of the south of Europe, is used in Italy, and *M. pustulata*, a native of China, is used by the Chinese, who also export it to Brazil, where it is the only kind employed. All the insects of this family were contained formerly in the genus *Meloe* of Linnæus. This genus, however, is now confined to those species which are without wings, and which have short, oval elytra, which lap over each other at the base of the suture. They crawl slowly along upon the ground, or amongst low herbage upon which they feed, especially relishing the wild buttercups, &c. When alarmed, they emit from the joints of the legs an oily yellowish liquor, whence they have obtained the name of *oil beetles*. Several species are vesicating, and are used instead of the blister fly, or mixed up with it. In Germany they were extolled at one time as a specific against hydrophobia; and the oil which is expressed from them is used in Sweden, with great success, in the cure of rheumatism, by anointing the affected part. In India a species of *Meloe* is used, possessing all the properties of the Spanish fly. The female *Meloe* deposits her eggs in the ground, where the young are hatched. The larvæ are small and active, and attach themselves to bees, especially species of *Anthophora*, by whom they are carried to their nests. There they live parasitic upon the bee larvæ, and undergo their metamorphosis in the cell of the anthophora. Several genera belonging to this family do not possess the vesicating qualities of the others. Such is the genus *Sitaris*. The larvæ of these insects are found in the nests of certain solitary mason bees, especially those of the genera osmia and anthophora.

Cantharis.—See CANTHARIDÆ.

Caouana.—A genus of reptiles belonging to the family of *Turtles*. See CHELONIA.

Caoutchouc. *India Rubber* or *Gum elastic.*—A vegetable substance obtained from incisions made in several plants possessing a milky juice. It is procured from *Urceola elastica*, *Ficus indica*, and one or two other species of the same genus, *Siphonia elastica* and *Jatropha elastica*. This last plant, the *Hevia guianensis* of some botanists, yields the largest quantity. The milky juice is received upon a mould of clay of various forms, but generally pear-shaped. It is white at first, but assumes the dark colour we see it generally possess, by being dried in smoke. This substance, when dry, has neither taste nor smell; it is tenacious, elastic, unalterable by exposure to the air, and fusible at a heat of 150°, giving out at the time a disagreeable odour. It is soluble in ether and the essential oils, and becomes soft in hot water, so as to be susceptible of adhering. At first, *Caoutchouc* was chiefly used for rubbing out the marks of lead pencils; hence its name of India rubber. It has now become a substance of very considerable importance in the arts and manufactures. As a varnish applied to clothes to render them waterproof, and for an immense variety of other useful purposes, large quantities are consumed annually. Previously to 1830, the importations to this country were comparatively inconsiderable, in that year amounting only to 52,000 lbs. In 1852, the imports amounted to 19,607 cwts. It is principally imported to Europe and elsewhere from Brazil, Columbia, and other parts of South America. The exports from Para in Brazil amounted in 1852 to about 32,860 cwts., besides 116,465 pairs of shoes.

Capparidaceæ. *The Caper family.*—A nat. ord. of dicotyledonous plants, containing numerous species which are either herbaceous or shrubs, some even acquiring the height of trees. They are spread over the tropical regions chiefly of Africa and America, a few only being found in the temperate countries of Europe. The juice of many is antiscorbutic, and the stimulating properties which most of them possess, is increased in some American species to such extent as to become poisonous. They may be divided into two tribes, first, *Cleomeæ*, with capsular fruit; second, *Capparеæ*, with fleshy fruit. The first tribe, *Cleomeæ*, contains eight genera. Of these *Cleome* has about 100 species, many of them beautiful flowers, and cultivated for their ornamental qualities. Some of the species are very pungent and are used as substitutes for mustard—others act as vesicatories. The second tribe, *Capparеæ*, contains a good number of genera. The genus *Capparis* has upwards of 150 species, some of which are cultivated in gardens as ornamental plants. The best known and most useful is *Capparis spinosa*, the caper tree, a native of the south of Europe, where it occurs plentifully as a low shrub, growing in clefts of old walls, fissures of rocks, and among rubbish. It is supposed to be originally a native of India, and to be the *hyssop* of Scripture. The buds of the flowers are pickled, and furnish the well known article for the table, *Capers*. In 1852, about 117,067 lbs. of these were imported into this country, to be retained for home consumption.

Capparis. *The Caper.*—See CAPPARIDACEÆ.

Capra.—See CAPREÆ.

Capreæ. *The Goat family.*—A sub-tribe of animals belonging to the class *Mammalia*, order, *Ungulata*, family *Bovidæ*, and characterized by having the horns subangular, recurved, com-

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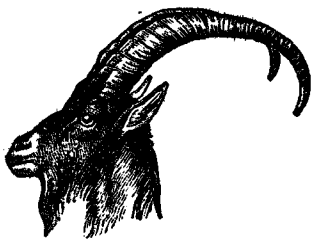
pressed, seated on the crest of the forehead, and by their union covering the top of the head. The males are generally bearded, and have a strong stench. They butt with their heads, first raising themselves upon their hind legs, and then coming down sideways against their enemies. The common goat, *Hircus Œgagrus*, may be taken as the



Hircus Œgagrus—The Common Goat.

type of the family. This animal is found as a native of every part of the Old World. It is a lively, sportive, wanton creature, impatient of confinement, fond of solitude, and climbing lofty rugged eminences. It is eminently curious, capricious, and confident; and is a very useful animal, supplying food and raiment to no inconsiderable degree. Not fewer than twenty-five varieties of the domesticated goat have been enumerated, and one wild variety called the Snake-eater, or Markhur, by the Afghans, a native of the mountains of Cashmere. The flesh of the young goat or kid is excellent eating; the milk of the adult is sweet, nutritive, and medicinal. The skin of the kid is peculiarly well adapted for the glove manufactory, and that of the adult is made into the morocco leather, so much used in book-binding, &c. It takes a dye better than any other skin, and was formerly much used for hangings in the houses of people of fortune. In the days of wigs, the hair of the goat was in high request, and the whitest were made of it. At present it is used in the manufacture of wigs for the dignitaries of the Church, and the members of the bar and bench. The wool of the Angora goat, *Capra angorensis Linn.*, the Cashmere goat, *Capra lanigera*, and the shawl goats or *Changra* of Nepal and Thibet, is famous for its quality. From these the beautiful Cashmere shawls of India, and the finest camlets, are made. The wool which is used in this manufacture is the soft curled wool close to the skin, and covered and protected by long shaggy hair. This manufacture is of much importance to the people of Cashmere. Under the Mogul emperors, work was found for 30,000 shawl looms. The demand for shawls of this kind has, however, diminished very much since then, and in 1840 it was stated that not more than 6,000 looms were employed. The average value of shawls exported from Cashmere amounts annually to 1,800,000 rupees. The goats in the East, as in Syria, are often black, and a species of cloth is made from their

Capra lanigera—Cashmere Goat.

skins having the same colour. This is the article commonly used by the Arabs for covering their tents, and a Bedouin encampment of this sort forms a very beautiful part of a landscape. It is this aspect that supplies the comparison in Solomon's Song, "I am black, but comely, O ye daughters of Jerusalem, as the tents of Kedar." Like the other domesticated animals of the family *Bovidæ*, it is very difficult to trace the original stock of the common goat. It is supposed, however, that it is derived from the wild goat of the mountains of Caucasus and Persia, called the *Paseng*. The ibex or steinbock, *Capra Ibex*, is another species of the goat family, inhabiting the Carpathian Mountains, the Pyrenees, and various parts of the Alps. The horns are extremely large and long, of a deep brown colour, and marked on the upper surface with protuberant transverse knots or half circles. They live in small flocks, and climb the most precipitous heights of lofty mountains. They are remarkably swift, and are amazingly agile and dexterous in leaping. They are said to precipitate themselves fearlessly down precipices, always falling on the horns, the elasticity of which secures them from injury. They form an object of the chase, but their pursuit is attended with much danger, and the hunter requires great strength, address, and activity. When close pressed the ibex will sometimes turn on his pursuers with impetuous rapidity and hurl them down the most frightful declivities. The wool of the sakeen or skyn, *Capra Himalayana*, a native of the Himalayas, Little Thibet, and the mountainous districts of Afghanistan, is used in Thibet for making shawls. These goats are so abundant in that country that they are killed for the sake of obtaining the wool. The hunters surround them when the mountains are covered with snow. The horns of this species are slit down longitudinally, and formed into bows for archery. The Jharab or Tehr, *Hemitragus Jemlaicus*, a native of the northern hilly region of Nepal, is another species of goat, though nearly allied to the deer tribe, by having a moist

muzzle and four teats, and the male having no beard. They inhabit the loftiest mountains of India, choosing the most inaccessible bare crags beyond the forest close to the perpetual snows. They feed in the open glades below such crags at early morning and evening, returning in the day to their awful fastnesses. They are gregarious in flocks of twenty or thirty, and sometimes of forty or fifty. If alarmed when feeding, they go off at full speed with a noise like thunder, but anon halt to gaze at the intruder, whose shot sends them off again, under the guidance of an old male whom they follow blindly. They are dauntless and skilful climbers. If they can but touch a rough edge or crevice now and then, they will run up nearly perpendicular precipices of many feet elevation, and they will stand on a bit of rock not larger than one's palm, looking confidently down over sheer space, with not a shrub to break the awful absence of rest for the foot.

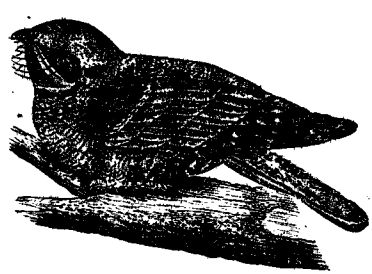
Caprella.—A genus of *Crustacea*. See LÆMODIPODA.

Capreolus.—A genus of deer See CERVINA.

Capricornis.—A genus of antelopes. See ANTILOPEÆ.

Caprifoliaceæ. *The Honeysuckle family.*—A nat. ord. of dicotyledonous plants, consisting of herbs or twining shrubs, growing for the most part in the temperate regions of the northern hemisphere, and containing 14 genera and 220 species. They are divided into two sub-orders, 1. *Loniceræ*, the true honeysuckles, with a tubular corolla; and 2. *Sambuceæ*, the elders, with an irregular corolla. The honeysuckle, *Caprifolium periclymenum*, the woodbine and eglantine of the poets, is well known for the sweet fragrance of its flowers. The common elder, *Sambucus nigra*, has long been celebrated as a *rural* medicinal agent, and was at one time highly commended as a remedy in dropsy. The berries are used in the manufacture of a wine called elder berry wine. The flowers are used for the same purpose, and a preparation from them is much employed as a cosmetic. The *Linnæa borealis*, called after the great Linnæus, belongs to this family, and is also said to possess diuretic and diaphoretic properties. The berries of *Lonicera cærulea* are a favourite food of the Kamtschatkadales. The snowberry is the fruit of *Symphoricarpus racemosa*. The bark of several species of the family is astringent, and the leaves of others are emetic.

Caprimulgidæ (*capra*, a goat; *mulgeo*, to milk)—*The Goatsucker.*—A family of birds belonging to the order *Passeres*, and tribe *Fissirostres*. They are characterized by having a small bill but an enormous gape, and very short weak feet. The species are nocturnal, and are found in all the four quarters of the globe. They resemble the owls in the colour of their plumage, and live on insects which they catch with great dexterity. They do not build nests, but lay their eggs, two in number, on the ground. Their note is peculiar and very distinctive. In Europe, the common goatsucker, *Caprimulgus Europæus*, the night-jar, the fern owl, &c., of the English, is almost the only representative of the family. The gape is strongly bristled, and it feeds chiefly on the fern chafer, *Melolontha solstitialis*, a beetle which is found in great abundance upon ferns. It spends the summer in the temperate countries of Europe, but on the approach of winter retires to the South of the Mediterranean Sea. Its arrival in Britain may be looked for from the middle of May to the end of that month, and its departure takes place towards the end of September or beginning of October. The goatsucker usually sits on a bare twig, and commences its song punctually at the close of day. Its note is singular, and resembles so much the sound of a large spinning wheel, that in Wales it is called the wheel bird. The ancients believed that this bird sucked the teats of cows and goats, and hence the name of *Goatsucker*. The powers of its wing are very great, and it takes its prey while flying. The size of this species is about that of the cuckoo. The guacharo bird, *Caprimulgus steatornis* of Humboldt, *Steatornis caripensis* of modern ornithologists, is as large as a common fowl, and is found in immense numbers in the celebrated cavern of Guacharo, in the valley of Caripe, in tropical America. These birds are frugivorous, however, not insectivorous, and the young hatched in the darkness of the cavern and exerting little or no muscular motion, become exceedingly fat. Once a year the Indians enter this cave, and destroy great numbers of these young birds for the sake of their fat. When melted down it will keep sweet for above a year, and this butter or oil of the Guacharo, as it is called, is the only oil used by the monks in the kitchen of the convent of Caripe. The cavern is called by the natives "a mine of fat," and the season for taking the young birds is called "the oil harvest." The whip-poor-will



Antrostomus vociferus—Whip-poor-Will.

of North America, *Caprimulgus vociferus*, the *Antrostomus vociferus* of Gould and other recent ornithologists, is 9½ inches in length and nineteen

in extent. The gape is exceedingly large, and the plumage resembles very much that of the European goatsucker. The notes of this bird are very curious, and seem pretty plainly to articulate the words which have been generally applied to them, *whip-poor-will*, the first and last syllables being uttered with great emphasis. When two or three are calling out at the same time, the noise is really surprising. Strangers find it impossible at first to sleep. It is asserted by the Indians that these birds were never known till a great massacre was made of their countrymen by the English, and that they are the departed spirits of the massacred Indians. Even at the present time the natives look upon them with no little superstition, believing that if they come near the house or alight upon the roof, some one of the household will shortly after die. The popetue goatsucker or pisk, *Chordeiles Americanus*, is another native of North America, very common in the fur countries, and ranging as far north as Hudson's Bay. Its cry, which is most frequently heard in the evening, is peculiar, and often seems to be made close to the listener, though the bird that produces it is so high in the air as to be nearly imperceptible. The sound is similar to that produced by the vibration of a tense thick cord in a violent gust of wind. In its flight the popetue resembles some of the falcons. The Australian species are represented by *Podargus humeralis* and *P. Cuvieri*. These birds during the day sleep so soundly, perched on the dead branch of a tree, that they are with difficulty aroused. The sportsman may shoot one without even disturbing its mate close by. *P. Cuvieri* is looked upon by some of the natives as a bird of ill omen, arising from the extraordinary sound of its hoarse unearthly cry, which resembles the words "more pork." The African species are represented by the genus *Macrodipteryx*, one species of which, *M. Africanus*, the pennant-winged night jar or long shafted goatsucker, a native of Sierra Leone, is remarkable for having a feather twice the length of its body arising from the carpus of each wing, and barbed only at the extremity. In their texture, these feathers are remarkably flexible, moving about with the least breath of wind. The inner barb is so broad that the laminæ in the middle measure 2½ inches. In India, there are several species, of which two are natives of the island of Ceylon, the *Caprimulgus Asiaticus* and *C. Maharattensis*. They are insectivorous, and at the season when the white ants assume their wings and come forth from their mounds, they are actively engaged in thinning their numbers. Their note and general habits resemble much those of the European species. Their undulatory motions when on the wing are particularly elegant and graceful.

Caprimulgus.—See CAPRIMULGIDÆ.

Caprina.—A genus of conchiferous *Mollusca* belonging to the family *Hippuritidæ* or *Rudistes*, and only found in a fossil state. They were formerly arranged amongst the *Brachiopoda*. One valve is fixed and the other free. Five species have been described from the green sand and chalk.

Caprinella.—A genus of conchiferous *Mollusca* belonging to the family *Hippuritidæ*, or *Rudistes*, and only found in a fossil state. They occur in the lower chalk. The shell is composed of a thick layer of open tubes, with a thin compact superficial lamina. Some of the species are large, and specimens occur measuring a yard across. Six species have been described.

Capromys (*capra*, a goat; *mus*, a mouse).—A genus of animals belonging to the class *Mammalia*, ord. *Rodentia* or *Glires*, and family *Muridæ*. The species of this genus are large rodents about the size of a rabbit or hare, and all natives of the West Indian islands. They are exclusively herbivorous, searching with avidity for aromatic plants. Their movements are slow and their motions resemble those of the bear. They climb trees with facility, and are frequently to be seen sitting on their hind quarters like squirrels, but only using one foot to raise their food to the mouth. They formerly constituted along with the agoutis, the chief game of the indigenous inhabitants of the islands. The species called the *Musk Cavy* burrows under ground, and smells so strong of musk that its retreat may be traced by the perfume. The animals of this genus are very gentle, and may be easily tamed.

Caprotina.—A genus of conchiferous *Mollusca* belonging to the family *Hippuritidæ* or *Rudistes*, and only found in a fossil state in the upper green sand. They were fixed by the right valve, and the smaller species occur in groups attached to oyster shells.

Caprovis. *The Wild Sheep.*—See OVEÆ.

Capsicum.—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and well known for its hot and stimulating properties. The species are extensively used on this account as condiments and pickles. The small species are called bird-peppers. The fruit of *C. baccatum* and *fruticosum*, &c., dried in the sun when ripe, then pounded and mixed with salt, forms what is known as *Cayenne pepper*. The fruit of *C. annuum*, a native of South America and the West Indies, forms the chief supply of what are known as *Capsicums*. They are large and fleshy, but vary much both in shape and colour. In some varieties they are as large as oranges. The smaller fruit of *C. minimum* and others are what are known as *Chillies*, chilli being the Mexican name for all the species of capsicum. They are all natives of the East and West Indies or tropical America. The acrid principle contained in these plants is called *Capsicine*.

Capulus.—A genus of shells. See CALYPTRÆIDÆ.

Carabidæ.—A family of coleopterous insects, containing numerous species inhabiting the southern parts of Europe, Asia, and North America. Upwards of 2,250 have been described or enumerated. They are for the most part carnivorous, and appear to play the same part among insects as the carnivorous animals among mammalia. They are of considerable service in keeping down the number of noxious insects with which our gardens and pastures might otherwise be overrun. Living upon other insects, they either attack them by force or entrap them by laying an ambuscade. Their strong mandibles, sharp and cutting at the extremity, and their feet endowed with great muscular force, give them an advantage over their ordinary prey. The body of these insects is of a very firm consistence, and the wings of many are merely rudimentary. During the day they conceal themselves under stones, in moss at the foot of old trees, or under the bark, and it is only at night they sally forth to seek their food. Most of them exhale a bad odour, and when seized, they discharge from both extremities an acrid, caustic humour, which produces similar effects on the skin to those produced by powdered cantharides. The larvæ are not well known. The greater number live and undergo their transformations in holes in the ground or under stones, and appear to be nearly as voracious as the perfect beetle. So numerous and varied are the species, that they have been distributed into several tribes or groups according to the structure of the palpi and tibiæ. Mr. Westwood divides them into five sub-families — BRACHINIDES or bombardiers; SCARITIDES or burrowers; HARPALIDES or black clocks; CARABIDES or dischargers; and BEMBIDIIDES or subaquatics. See these words.

Carabides.—A sub-family of beetles belonging to the large family *Carabidæ*, consisting of insects, for the most part of a large size, and generally adorned with brilliant colours, and a metallic lustre. They are usually found concealed under stones, or amongst moss at the foot of trees, though some species are seen in the open day in the roads and fields running with great rapidity. The elytra in the typical species are soldered together, and the wings are obsolete. The genus *Carabus* is the type of the group, and notwithstanding its modern restrictions, comprises nearly 200 species, seventeen of which are natives of Great Britain. They are, with few exceptions, confined to temperate climes, being seldom found nearer than 30° to the equator. They inhabit mountainous districts, and large forests, and are very voracious. They exhale a peculiar odour, resembling that of tobacco. The largest species belong to the genus *Procerus*, four species of which have been described, living under dried leaves in the forests, and on the mountains of Russia, Hungary, and Asia Minor, and all being of a beautiful blue or violet colour above, and black beneath. *Procerus scabrosus* is the largest of the carnivorous beetles known.

Carabus.—See CARABIDES.

Caracal.—A genus of cats. See FELINÆ.

Caranx.—A genus of acanthopterygious fishes belonging to the family *Scomberidæ*. This genus contains a number of species, amongst which *C. vulgaris* is the most common and the most widely diffused. It is abundant on the coasts of France, where it is called saurel and bastard mackerel. They sometimes make their appearance on the British shores in immense shoals, and are known by the name of *Scad* or *Horse Mackerel*. They feed on the fry of herrings, are oily fish, and not good to eat. Some of the foreign species, indeed, are even poisonous, and it behoves the traveller to beware of these fish when abroad.

Carapa.—A genus of dicotyledonous plants belonging to the nat. ord. *Meliaceæ*. Two or three species are known. One is a native of Guiana, where it is called *carapara* by the natives—hence its generic name. The bark is used as an anthelmintic and febrifuge. Another is a native of Senegal and Guinea, *Carapa Touloucouna*, the toulouma of the natives, from which an oil called tallicoonah, or kundar oil, is obtained, which has the reputation of being an anthelmintic, and is said to be well suited for burning in lamps. With this the natives anoint their bodies to protect them from the bites of insects.

Carapace.—The external covering of certain classes of animals, resembling somewhat a buckler, and the use of which is to protect the body. The armadillos amongst mammalia, the turtles amongst reptilia, and the siluri amongst fishes, have a covering of this sort which is sometimes termed carapace. The term, however, is chiefly applied to the crustacea, rotatoria, and infusoria. In the crustacea, it is used to designate the external crust or shell with which the body of the animal is more or less covered. In the rotatoria and infusoria, the term has been divided into three kinds—the *testa* or *testula*, a covering enclosing the body of the animal, and resembling that of the tortoise, which may be seen in the species of the family BRACHIONÆA—the *scutellum*, which is round or oval, and only covers the back of the animal like a buckler—and *urceolus*, an envelope like a ball or cylinder, open at one end, closed at the other, and within which the animal can withdraw itself. Such we see in the genus DIFFLUGIA.

Carbon.—An elementary substance which occurs pure in nature as well as in combination with other substances. When pure it constitutes the *diamond*, and forms one of the most precious gems, remarkable for its high lustre and extreme hardness. It scratches every other substance, and can only be cut by being worn down, as it were, by rubbing one diamond against another, and is only polished by its own powder. When

ignited in contact with air, it is converted wholly into carbonic acid gas. In its chemical nature, the diamond is identical with charcoal. The finest ought to be perfectly crystalline, resembling a drop of clear spring water, in the middle of which is perceived a strong light playing with a good deal of spirit. Many diamonds, however, are coloured, green, yellow, red, brown, blue, and black. These precious gems are found in India, Borneo, and Brazil; they have been also detected in the Ural Mountains, in the United States of America, in the province of Constantine in Africa, and latterly in Australia. Our chief supply of diamonds is from Brazil, and in most instances they are obtained from alluvial washings. When polished, they are sold in two forms, *rose diamonds* and *brilliants*. The commercial value of diamonds in the wholesale trade is not subject to much fluctuation. They are sold by the *carat*, which is equal to 3·077 grains. Brilliants of from one grain to two and a-half grains, when cut and fine, are worth from £7 to £8 per carat. Those of a carat weight each are worth £9 or £10. Brilliants of two carats each are worth from £27 to £30; of four carats each, from £100 to £130. They are rarely of six carats weight; but such, if fine, would sell for £230 or £250 each. Some years ago Brazil was estimated to furnish Europe with 25,000 or 30,000 carats per annum of *rough* diamonds. Diamonds sometimes occur of large size. The largest known belongs to the Emperor of Brazil, and in 1840 was still uncut. It weighed 1,680 carats, and, taking the usual method of valuing diamonds, ought to be worth the enormous sum of £5,644,800! The Pitt or Regent diamond was sold to the Regent Duke of Orleans for £130,000. A very large diamond is mentioned by Tavernier as being in the possession of the Great Mogul, which weighed originally 2,769 grains, and after being cut 861 grains. This appears to be the same as the one now belonging to the Queen of England, and so well known as the Koh-i-noor. Besides being used as articles of ornament and luxury, diamonds are employed in the arts. They are used for cutting glass, cameos from the onyx stone, carnelians, &c. Carbon is found also in a tolerably pure state in GRAPHITE or plumbago. It enters largely into the composition of AMBER, ANTHRACITE, and BITUMEN, and forms the distinguishing element of COAL. In union with oxygen, in the state of carbonic acid, carbon constitutes an important ingredient in *limestones*, and it enters as a chief element into the formation of all animal and vegetable substances.

Carbuncle.—See GARNET.

Carcharias.—A genus of fishes of the shark family. See SQUALIDÆ.

Carcinus.—A genus of decapodous *Crustacea* belonging to the order *Brachyura*. Only one species is known, *C. mœnas*, the shore crab or harbour crab. The general colour is blackish-green, but it varies considerably. It is by far the most common crab on our shores, occurring in great numbers in almost every locality on our coast. It generally lives in shallow water, and is left by the receding tide amongst the rocks and stones, under which it hides itself when disturbed, and indeed it can remain out of water for some time, burying itself in moist sand. This species is much eaten by the poorer classes on the coast, the flavour being considered delicate and sweet. Of carnivorous habits, it lives on the fry of fish, shrimps, and other small crustacea, dead fish, &c. It runs with considerable speed, but with a sidelong awkward gait. When suddenly alarmed, or handled, it simulates death as completely as many beetles do. It buries its ova in the sand, and the young are hatched in about forty-eight hours, but very unlike the parent. Considerable changes take place in its appearance before it arrives at the perfect form.

Cardamine.—A genus of plants belonging to the nat. order *Cruciferæ*, sub-order *Siliquosæ*, and tribe *Arabideæ*. It contains a number of species, amongst which there are five or six natives of Great Britain. *C. pratensis* is perhaps the best known and most abundant. It is the cuckoo flower, common ladies' smock, bitter cress, &c., of England, and in Scotland is known by the name of bog-spinks. It flowers in May and June, and covers the meadows with its pretty blossoms, upon which and the leaves children imagine the cuckoo drops its frothy spittle. Hence one of its names. The leaves are bitter, and being in form something like those of the water cress, has given rise to another of its names. At one time it had the reputation of being diuretic and antispasmodic. In autumn, little bunches of leaves may be often seen to grow from the upper surface of the old but perfectly fresh leaves, each bunch throwing out a radical fibre, that creeps along in search of a soil proper to take root in. These parasitical bunches are young plants, and will detach themselves either when the root fibre has reached the soft ground, or when the parent leaf has decayed. The leaves of *C. hirsuta* when ripe and laid upon the ground, will, in like manner, put forth buds which produce new plants; and the species is extensively propagated in this way in moist soils.

Cardiidæ. *The Cockle family.*—A family of conchiferous *Mollusca* comprising few genera, but many species. The genus *Cardium* is the typical genus, and contains 200 recent species which are widely distributed, and occur at all depths from the sea shore to 140 fathoms. About 270 fossil species have been described. Several species of cockles are used as food by the lower classes, but the chief kind is the common cockle *C. edule*. This is a gregarious species, inhabiting the sands at low water, especially where there are large tracts in the neighbourhood of estuaries. They are generally from four-fifths to one inch in length, though they

vary much in this respect as well as in form. In some parts of our coast the cockle forms a considerable article of commerce, large quantities being brought daily to the London market. On the coast of Devon they are cultivated in beds, and grow to a considerable size. Some of the exotic species are remarkable for their brilliant colours, and the sub-genus, *Hemicardium*, is peculiarly depressed and strongly keeled, so that the shells in many of the species are several times broader than they are long, and the hinder side is difficult to be distinguished from the anterior one. The fossil genus, *Conocardium*, is like the preceding in shape, but has a long siphonal tube near the umbones. About thirty species are described.

Cardinia.—A genus of bivalve shells. See CRASSINIDÆ.

Cardiocarpon (*καρδια*, heart; *καρπον*, fruit).—Fossil fruits occurring in the coal formation, of a compressed heart-shaped form. They are supposed to have been the ripe fruits of plants belonging to the order *Gymnospermæ*, and probably of the genus *Calamites*, as they are very often found associated with those fossil remains. It has been conjectured, too, that they may be the capsules of the *Lepidodendron*, one of the *Lycopodiaceæ*.

Cardiospermum (*καρδια*, heart; *σπερμα*, seed).—A genus of dicotyledonous plants, belonging to the nat. ord. *Sapindaceæ*, consisting of herbaceous and mostly twining plants, chiefly natives of tropical America. One species, *C. halicacabum* is cultivated in our gardens, and has its seeds covered with a heart-shaped husk. These are used in its native country, India, for making bracelets and necklaces. The roots are recommended in form of a decoction for diseases of the urinary organs.

Cardium.—See CARDIIDÆ.

Carduelis. *The Goldfinch* and *Canary.*—See FRINGILLINÆ.

Carduus. *The Thistle.*—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*. Thistles are of two kinds, and both are numerous in species. The one kind have the pappus of the seed capillary, or hairy, and these form the restricted genus *Carduus*. The others have the pappus plumose, and are ranged under the genus *Cnicus*. Thistles, in general, are great pests to the farmer, and some of the species having creeping roots are very difficult to eradicate. Careful husbandry has diminished the evil very much, though still in some parts of the country reapers are *gloved* in order to reap the harvest with impunity. They are excessively prolific in seeds. One thistle seed, it has been calculated, will produce at the first crop 24,000, and consequently, five hundred and seventy-six millions of seeds at the second crop! *Carduus nutans* is one of our handsomest species, and the fine large flowers and the under sides of the leaves smell powerfully of musk. *Carduus marianus*, or milk thistle, is considered by Dr. Johnston to be the true Scotch thistle, though many others think the burr thistle, *Cnicus lanceolatus*, has equal claim to the honour. The Scotch thistle of gardeners is the *Onopordum acanthium*. The seeds of the burr thistle are the favourite food of the goldfinch.

Caretta.—A genus of reptiles belonging to the family of *Turtles*. See CHELONIA.

Carex.—A genus of monocotyledonous plants belonging to the nat. order *Cyperaceæ*, and containing numerous species, though none of much importance directly to man. They are almost all natives of boggy or wet places in which situations they may be very useful by gradually forming a soil upon which plants of more immediate utility to man may ultimately grow. *C. arenaria* grows on the sea shore, and in conjunction with *Arundo elymus*, &c., tends to bind the loose and shifting sands. This species has also a certain reputation on the continent as a diaphoretic and diuretic, and is used as such under the name of German sarsaparilla. *C. sylvatica* is employed by the inhabitants of Lapland, of which country it is a native, when carded and dressed, as a wadding to protect their hands and feet from the cold.

Cariacus.—A genus of deer. See CERVINA.

Cariama.—A genus of birds. See ARDEIDÆ.

Carica.—A genus of dicotyledonous plants belonging to the nat. ord. *Papayaceæ*. *C. Papaya*, the papaw tree, growing twenty feet high, and a foot in thickness, is a native of South America and the West Indies. The trunk abounds in a milky juice; and the fruit, containing a yellow succulent pulp of a sweetish taste and aromatic smell, is much esteemed by the inhabitants of the countries of which it is a native. It is seldom eaten raw, but when boiled is esteemed a wholesome sauce to any kind of fresh meat. It is also pickled in vinegar, and preserved in sugar as a sweetmeat. The most remarkable quality, however, which this tree possesses, is that of rendering all kinds of meat washed in water impregnated with the milky juice, perfectly tender. Old animals, it is said, fed upon the leaves or fruit, however tough the flesh would otherwise have been, are rendered in this way quite delicate eating. The juice of the trunk is said to be a powerful vermifuge, and is also used as a cosmetic to remove freckles from the skin.

Carinaria (*carina*, a keel). *The Glassy Sailor.*—A genus of nucleobranchiate gasteropodous *Mollusca* belonging to the family *Pterotracheidæ*. The animal is elongated, translucent, granulated, with a large laterally compressed tail, and the foot formed into a rounded broadly-attached ventral fin, with a small marginal sucker. The heart and gills are protruded, forming a small dorsal mass which is called the nucleus, and which is covered with a very thin, keeled, concentrically-waved, obliquely-conical shell. The animals swim on the calm ocean with the back down-

wards, and move rapidly by means of the vigorous action of their fin-like tails, or by their ventral fin or foot. They feed on small *acalephæ* and *mollusca*, and inhabit the warmer parts of the Atlantic and Indian oceans. Five species are known, one of which, *C. cymbium* or *Mediterranea*, is found in considerable numbers in the neighbourhood of Nice; and another of a much larger size inhabits the Indian and Chinese seas. The shells have a great resemblance to the keel of a boat.

Carlina. *Carline Thistle.*—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*. There are a number of species belonging to this genus, all of them resembling the thistle in habits. One species, *C. caulescens*, is a native of the south of Europe, and the fleshy receptacle, which exceeds that of the artichoke in size, is eaten by the natives, and is said to equal it in flavour.

Carnelian.—See AGATE.

Carnivora.—An order of animals belonging to the class *Mammalia*, and synonymous with the order *Ferœ*. As the name indicates, the animals contained in this order are generally fierce and rapacious, and live solely, or at least in great part, upon flesh or animal matters. Most of them associate more or less of vegetable matter with their food, and there are even some that live more upon the latter than the former. Their teeth form characteristic marks. They have distinct and well defined canine, cutting and grinding teeth in each jaw, placed in a regular uninterrupted series. The feet are formed for walking, and are furnished with claws—the thumbs of the front, and generally of the hinder extremities also, being placed on the same line with the toes. This order is divided into several large families, as FELIDÆ, URSIDÆ, TALPIDÆ, &c., &c.

Carpodacus.—A genus of finches. See PYRRHULINÆ.

Carpinus. *Hornbeam.*—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, sub-order *Cupuliferæ*, and containing five or six species, which are handsome trees, natives of Europe, America, and Nepâl. The common hornbeam, *C. Betulus*, an indigenous British tree, resembles the beech, and rises to the height of fifty or sixty feet. The wood is hard and tough, and is well suited for making wheel cogs, screw presses, handles of tools, and many other purposes, for which strength is required. It is in much request on the continent as fuel, and was formerly much prized in this country in ornamental plantations, as it bears clipping well, and when thus stunted retains its withered leaves all winter.

Carpocapsa (*καρπος*, fruit; *καπις*, the act of devouring).—A genus of nocturnal lepidopterous insects, the larvæ of which feed upon fruit, some species living in the inside of those fruits which have a kernel, and others in such as apples and pears, &c. The most common species is *C. pomonana*, which is found all over Europe, where apples and pears are cultivated. As soon as the fruit is set, the butterfly deposits an egg in its substance, which is there hatched, the larva coming to its full size in the end of July or beginning of August, when the apples have arrived at about two-thirds of their size. It then pierces a hole in the circumference, and escapes either under the bark of the tree, or into the ground, where it forms a cocoon, and remains all winter, appearing as a perfect insect in the May following.

Carpophaga (*καρπος*, fruit; *φαγειν*, to eat).—A genus of pigeons. See COLUMBIDÆ.

Carthamus.—A genus of plants belonging to the nat. ord. *Compositæ*, and containing several species. *C. tinctorius* is a native of India, Egypt, and the Levant, and the flowers are so like those of the saffron, that when dried it is difficult to distinguish them. Hence the plant is called the bastard saffron, or safflower. They are imported in large quantities from Egypt and the East Indies, and are used as a dye. They possess two colouring principles, one yellow, very soluble in water, and of little value; the other red, soluble only in alkalies, from which it is precipitated by acids, and exceeding in delicacy and beauty, as it does in costliness, any which can be obtained, even from cochineal. It is not very fixed, and dyers use it for silks and cotton stuffs. This fine colour, slowly dried and ground with the purest talc, produces the beautiful *rouge*, known in Paris as the *Rouge végétale*, *Spanish vermilion*, or *Lake of Carthamus*. The seeds, known as parroquet seeds, are violently purgative when taken by man, but are the favourite food of parrots. In Egypt, this plant has been cultivated from the earliest ages for the use of the dyer. During the four years previous to 1854, the average quantity of flowers imported into this country was 7,500 cwts. annually, the price at that time varying from £6 to £9 10s. per cwt. in bond.

Carum. *The Caraway.*—A genus of plants belonging to the nat. ord. *Umbelliferæ*, and deriving its name from *Caria* in Asia Minor, where it was originally found. The caraway seed, *C. carui*, is a native of the greater part of Europe, and is now naturalized in England. It is extensively cultivated in some parts of Essex. The seeds are well known for their pleasant spicy smell and warm aromatic taste, and are much used by confectioners. They are also distilled with spirituous liquors to improve their flavour. The tender leaves in spring are boiled in soups, and the roots are eaten as parsnips, and by many preferred to them.

Carya. *The Hickory.*—A genus of dicotyledonous plants belonging to the nat. ord. *Juglandaceæ*, and containing several species, all natives of North America, and growing to the height of stately trees. The wood of these trees is heavy, tough, and strong, and red at the heart. It is used for making shafts and springs for

carriages, large screws, as bookbinders' presses, wooden cogged wheels, chair backs, and a variety of other purposes. The nuts are much esteemed in North America, and form a small article of trade.

Carychium.—A genus of shells. See AURICULIDÆ.

Caryocar (*καρυον*, a nut).—A genus of dicotyledonous plants belonging to the nat. ord. *Rhizobolaceæ*. The species are natives of tropical America, and the nuts are eatable, and afford by expression a very abundant, thick, buttery oil, which the inhabitants of Guiana use as butter. The nuts of one species are known in the London fruiterers' shops as butter nuts.

Caryophyllaceæ. *The Clove Pink*, or *Chickweed family.*—A nat. ord. of dicotyledonous plants, the species of which form a very natural group. They are generally herbaceous plants, inhabiting the temperate and cold parts of the globe, or living in the mountainous regions when they occur within the tropics. Fifty-three genera are enumerated, and upwards of 1,000 species. They are divided into two large groups—the *Alsineæ*, in which the leaflets of the calyx are distinct, and the petals are sessile; and *Sileneæ*, in which the leaflets of the calyx are united to form a tube, and the petals are provided with a claw. Few of the plants belonging to this order are possessed of any properties of importance, but many are cultivated as ornaments to the garden. Such particularly are the varieties of *Dianthus Caryophyllus*, the clove pink or carnation, known by the names of picotees, bizarres, and flakes. Several other species of *Dianthus*, or pink, as the *D. barbatus*, or sweet william, of *Lychnis*, *Silene*, and *Saponaria*, or soap wort, are garden flowers. The species of the latter genus contain a principle called *Saponine*, and the leaves, from the quantity of soap-like matter contained in them, are frequently made use of in washing.—A species of arenaria, *A. peploides*, is occasionally used as a pickle, and in Iceland it serves as an article of food.

Caryophyllæus.—A genus of animals belonging to the class *Entozoa*, order *Trematoda*. They are small worms, living parasitic in the intestines of some fresh water fishes, as the bream, barbel, &c.

Caryophyllia.—A genus of corals. See ANTHOZOA.

Caryophyllus. *The Clove Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*. *C. aromaticus*, the only species of the genus, is a small tree from fifteen to thirty feet high, and a native of the Moluccas. The flowers are odorous, and the bark, fruit, roots, and leaves, are all more or less aromatic. The flower buds constitute the *Cloves* of commerce. When prepared for the market, they have exactly the appearance of a small nail, from which resemblance they derive their name,—*Clavo* in Spanish, *Clou* in French—signifying a nail, and giving origin to our *Clove*. These buds as soon as gathered are dried in smoke over a fire, in the sun, or in a kiln, and are then exported in small chests or bags. Good cloves have a strong, fragrant, aromatic odour, and a hot, acrid, aromatic taste, which is permanent. They contain a volatile oil, which is aromatic and acrid, and has been used as a condiment and a stimulant carminative. The clove trade was at one time a monopoly of the Dutch. From the expulsion of the English from Amboyna in 1623, the Molucca islands have been in their possession, and with a short sighted policy they for a length of time destroyed the clove plants in all the islands except Amboyna, the seat of their power. Preferring to derive a large profit from a stunted and petty trade, to a moderate profit from a trade that might have afforded employment for a very large amount of capital, they adopted this plan in order to confine the growth and trade of cloves to within the narrowest limits. When Mr. Crawford wrote his account of the Eastern Archipelago, he mentioned that the price paid by the government to the native growers was about 3½d. per lb. avoirdupois. When sold on the spot, the monopolizer exacted eight times that price, or 2s. 2d. per lb. When brought direct to England, the average price was 3s. 8d. the lb., or an advance on the natural export price of 1,258 per cent. Cloves are now, however, cultivated both in the East and West Indies, though by far the best are those from Amboyna, the Moluccas appearing to enjoy a decided superiority in the production of cloves to every other country. The average amount of cloves imported for home consumption into this country used to be about 80,000 lbs. a-year; and, in 1832, the duty (2s. per lb.) amounted to £8,169. The duty is now lessened, and the quantity imported greater; in 1852, the quantity admitted for home consumption being 174,729 lbs., the price varying from 8d. to 1s. per lb.

Caryota.—A genus of palms, containing only a few species, natives of tropical Asia. *C. urens* is the best known species, growing in mountainous situations, and obtaining a height of sixty feet. Its fruit is a nut about the size of a plum, with a thin yellow rind, so acrid that it produces a severe sensation of burning when applied to the skin, hence its specific name, *urens*.

Cassava.—A kind of fecula obtained from the roots of the *jatropha manihot*. The juice of the root of this plant contains a very powerful poison, which is now ascertained to be prussic acid. This, however, is easily driven off by heat, and the residue becomes a very nutritious article of diet. The roots are peeled, well washed, and then ground between millstones till they are reduced to a state of paste. The juice is pressed out and the paste dried in vessels over a brisk fire. Formed into cakes and cooked between two plates of iron, it forms the common food of the Indians and negroes of our colonies. Half a pound daily, is said to be sufficient to support

a vigorous man. Tapioca is a preparation of cassava, but is much less nutritive.

Cassia.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Cæsalpineæ*. The species chiefly inhabit the tropical or temperate parts of the world, and are very numerous, between 200 and 300 having been described. They are trees, shrubs, or herbs, and possess pinnated leaves. This genus includes the plants which produce the *senna* of commerce, so much used in medicine. What are called senna leaves are not the produce of only one species of cassia, but of several. The leaves of *C. obovata* are sold under the name of "Tripoli" and "Aleppo" senna, and the plant is a native of the deserts of Egypt and Tripoli, Syria, and Senegal. The leaves of *C. acutifolia* are known as the "Alexandrian" or "Officinal" senna, and are brought from Egypt and Sennaar. The "Mecca" and "Tinevelly" senna of commerce is the produce of *C. angustifolia*, a native of Arabia, and cultivated in India. The leaves of another species from Nubia, *C. tomentosa*, are also found occasionally mixed with those of the Mecca and Alexandrian senna. These plants have lately been separated from the genus cassia, and formed into a distinct one under the name of SENNA. The *Cassia fistula* is now referred to the genus CATHARTOCARPUS.

Cassicus (*cassis*, a helmet).—A genus of birds belonging to the conirostral tribe of the order *Passeres*. The beak of the birds of this genus is large and conical, thick at the base, which rises on the forehead and slopes out the feathers, so as to give the appearance of a helmet. They form part of the family *Sturnidæ*, and along with the Baltimore orioles and the troopials, they constitute a small sub-family, under the name of *Icterinæ*. The species are all natives of America, living generally in troops in woods and forests, feeding upon worms, insects, seeds, and berries, which they swallow whole. They construct their nests in the form of an alembic or purse, and suspend them to the extremity of the branches of trees. In captivity they are docile, and learn to articulate words, imitate the cries of animals, and whistle tunes. *Cassicus cristatus*, the crested oriole, is about the size of a magpie, and is a native of Surinam. The individuals live in society; many dwelling together on the same tree, and suspending their nests from the very extremity of the farthest branches. The nest is in form of a purse, three feet long and ten inches broad at the lower part, which is hemispherical. The entrance is near the top, and the bottom is lined with dry leaves. The Baltimore oriole, *Icterus Baltimore*, inhabits North America from Canada to Mexico, and is even found as far south as Brazil. It is about the size of a sparrow, and is beautifully coloured with black and orange. Its chief food consists of caterpillars, beetles, and bugs, and it is remarkable for its clear mellow whistle, which is described as being uttered with the pleasing tranquillity of a careless ploughboy, whistling merely for his own amusement. The nest of this bird is made with great care, and we are told that in the season when the Baltimore builds, the women of the country require to watch narrowly their hanks of thread and silk that are out bleaching, as the birds frequently carry them off, so well adapted do they find them for their purpose. The Baltimores do not congregate in flocks like the preceding, but their nests are formed in the same way.

Cassida.—See CASSIDIDÆ.

Cassididæ.—A small family of phytophagous beetles of a peculiar broad subdepressed form, and known by the name of tortoise beetles. The head, body, and legs, are in many completely covered by the corselet and elytra, which form a sort of shield like that of a tortoise. Their motions are slow, and they seldom fly, being generally found immovable on the plants upon which they feed, and scarcely distinguishable from them. The larvæ of these beetles are very peculiar. That of the common species, *Cassida viridis*, when first born is soft, flat, and short, and the extremity of the body is terminated by an elongated forked appendage. The anus is situated between the divisions of this fork, and by the assistance of this instrument, the excrement is by degrees collected, so as to form a parasol, which the insect has the power of elevating or depressing at pleasure. At the moment of threatened danger it can be raised over the body so as completely to conceal the insect, which then looks like a mere mass of excrement. When the danger is passed it can lower its parasol, or even throw it off altogether.

Cassis. *Helmet shell.*—A genus of gasteropodous *Mollusca*, allied to the family *Buccinidæ*. The animals of this genus have a large foot, which extends beyond the shell before and behind, and carries a small elongated horny operculum with the nucleus in the middle of the straight inner edge. They walk slowly, and inhabit tropical seas in shallow water, sometimes living under the sand and preying upon small molluscs which they find there. The shell is in general large, ventricose, with irregular varices, and the inner lip spread over the body whirl. The inner strata of these shells are differently coloured from the exterior, and several of the species are accordingly in great request for the manufacture of shell cameos. Those carved from *C. cornuta* are white on an orange ground; from the queen conch, *C. Madagascariensis*, white upon dark claret colour; and from *C. rufa*, pale salmon or orange. This last species is the one most used, and forms a considerable article of commerce.

Castanea. *The Chestnut.*—A genus of plants belonging to the cupuliferous or corylaceous tribe of the nat. ord. *Amentaceæ*. This genus contains several species, all trees, the best known and most important of which is the sweet or Spanish chest-

nut, *C. vesca*. This is a tree of considerable size, a native of all the southern parts of Europe, extending eastward to the Caucasus, and is equally abundant in North America, growing in the high and hilly parts of Virginia, the two Carolinas, and Georgia. On Mount Etna it acquires an immense size, and in the chestnut forests there, some individuals are in existence which are of great antiquity. One of the wonders shown to travellers used to be the hundred horse chestnut, from its being able to contain a hundred mounted men in its hollow trunk, which measured 160 feet in circumference. In the department of Cher, near Sancerre, there is still standing a tree which at six feet from the ground, measures more than thirty feet in girth, and is computed to be upwards of 1,000 years old. The wood of the chestnut resists the action of water, and is therefore well adapted for mill timber, waterworks, piles, &c. The seeds contain a large quantity of nutritious starchy matter of a sweet flavour, and are extensively used as food in some parts of the continent. In the Limousin, in Corsica, Spain, and Italy, they form a substitute for bread for a considerable portion of the population, and in the former district the inhabitants are said to prepare them in a peculiar way, which deprives them of their astringent and bitter qualities. Chestnuts are imported into this country from Spain and Italy in considerable quantity. In 1832 when there was a 2s. duty upon the bushel, the nett amount produced from this tax was £2,321 12s. 10d., showing that in that year the consumption in this country must have amounted to 23,216 bushels. In 1852 the importation had increased to 54,032 bushels.

Castor. *The Beaver.*—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Muridæ*. This genus is distinguished from all the others of the order by the hind feet being nearly completely webbed, and by possessing a broad horizontally flattened scaly tail. The common beaver, *C. fiber*, is the only living species of the genus. It is a native of Europe and North America. In Europe it is now chiefly found burrowing on the banks of the Danube, the Weser, and the Rhone, though formerly it was a native of Scotland and Wales. In America its chief habitations are in Canada, though in geographical range it extends from Hudson's Bay, in lat. N. 60°, to lat. N. 30°, in Louisiana. The beaver is the largest of all the rodent animals, being generally two feet long exclusive of the tail. It uses its fore feet to seize and manage objects with, as readily as the common squirrel. The habits of the beaver are aquatic, the hinder feet serving as strong oars, and the tail as a rudder. They are remarkable for the extraordinary faculties they possess in constructing houses for themselves. This is best seen in America in such situations as they can assemble in great numbers together, for it is a curious fact, that as soon as their colonies are broken up and the individuals scattered, they lose their instinct for constructing dwellings and become mere burrowers in the ground. In suitable situations they are found united to the number of 200 or 300 individuals. They prefer the banks of streams where there is sufficient power of water to float the trees and articles used by them in the construction of their edifices, and they generally choose those parts that have such a depth of water as will resist the frost in winter and prevent it from freezing to the bottom. When they build their houses in small rivers or creeks, they make a dam quite across the river at a convenient distance from their dwellings so as to raise the water to a proper level. For this purpose they cut down considerable sized trees by means of their sharp incisor teeth, lay them judiciously across the stream, and then fill up the interstices with twigs, stones, mud, &c. An old dam frequently repaired and undisturbed, sometimes becomes a solid bank, capable of resisting a great force both of water and ice. Their houses serve for two or three families, and each is divided into two apartments, the upper dry, for the habitation of the animals, the lower under water, for their provision. The latter only is open, having its entrance under water, without any communication with the land. The beaver lives upon the bark of trees and the roots of the yellow water-lily, &c. It is an animal that is easily domesticated, and becomes attached to its master. Between the origin of the tail and posterior part of the thighs under the skin, are two pairs of glands. The upper pair secrete an unctuous substance of a powerful odour called *Castoreum*, which is used in medicine as an antispasmodic. The flesh of the beaver is much prized by the Indians and Canadian traders, especially when it is roasted in the skin after the hair has been singed off. The principal value of the beaver, commercially, consists in its fur. It has for a long period been extensively used in the manufacture of hats. The trade has fluctuated considerably, but the present annual importation of beaver skins into this country from the fur districts of North America, amounts to about 60,000. Fossil remains of the common beaver have been found in the lacustrine formations of this country and elsewhere; and the cranium and teeth of a much larger species have been discovered in the Norwich Crag and on the sandy borders of the Sea of Azof. This latter species has been described under the name of *Trogontherium Cuvieri*.

Casuarineæ. *The Beef-wood tribe.*—A subfamily of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*. There is only one genus *Casuarina*, the species of which are trees or shrubs peculiar to Australia, part of Asia, and the Polynesian islands. Their branches are long, drooping, green, and wiry, bearing membranous toothed sheaths instead of leaves. Some of the species yield excellent timber, which is called

beef-wood, from its having some resemblance to raw beef. One species *C. quadrivalvis*, is called the she-oak. The young branches and cones when chewed yield a pleasant acid, and cattle are said to be fond of them.

Casuarius. *The cassowary.*—See STRUTHIONIDÆ.

Catalpa.—A genus of plants. See BIGNONIACEÆ.

Cataractes.—A genus of birds. See ALCIDÆ.

Catastomus.—A genus of malacopterygious fishes belonging to the family *Cyprinidæ*. There are several species inhabiting the fresh waters of North America. They live upon small fresh water molluscs, which they are enabled to take by means of their lips; these being suitable for sucking, are protruded forwards by the jaws. *C. hudsonius*, the gray sucking carp, is common in all parts of the fur countries, and is considered excellent for making soup. It is singularly tenacious of life, and may be frozen and thawed again without being killed.

Catechu.—An extractive matter obtained from different trees in India. Three kinds occur in commerce—1. *Bengal Catechu*, obtained from a species of ACACIA; 2. *Bombay Catechu*, the produce of *Areca Catechu*, a palm tree; 3. *Gambir*, an extract from the wood of *Nauclea* (*Uncaria*) *gambir*, a genus belonging to the nat. ord. *Rubiaceæ*. This last kind is used for producing different shades of brown, in calico printing.

Catha.—A genus of dicotyledonous plants belonging to the nat. order *Celastraceæ*. *C. edulis* is a native of Arabia, and is called Khât by the Arabs, who attribute to it the power of causing in those who eat it extreme watchfulness, so that a man may stand sentry all night long without drowsiness. They also regard it as an antidote to the plague.

Cathartes (*καθαρτης*, what purifies). *The Gallinazo.*—A genus of rapacious birds belonging to the order *Accipitres*, family *Vulturidæ*. This genus possesses a large and strong beak, with longitudinal, oval, nostrils, but no fleshy crest. The head and neck are without feathers, and the plumage elsewhere is nearly black. The species are all American. The Turkey buzzard, *C. aura*, is the type of the genus, a large bird 2½ feet in length and measuring with the wings extended upwards of six. It is a true carrion feeder and possesses a wonderful facility of finding out its prey, though it has been much disputed by naturalists whether it is by the sense of sight or smell. It appears to possess both in a high degree. It may generally be known at a distance by its lofty, soaring, and most elegant flight. In the neighbourhood of towns and farm houses, the Turkey buzzard becomes quite familiar with man, and by him in such situations is seldom molested on account of its usefulness in removing the refuse of cattle which have been slaughtered, and all sorts of carrion left lying about. In Jamaica it is called the John Crow vulture. *C. Californianus*, the great gallinazo or Californian vulture, is an immense bird rivalling the condor itself in size. It is confined exclusively to the Pacific coast, and is particularly abundant in California during winter. When solitary it is shy and difficult of approach, but like the preceding species, it often ventures to the neighbourhood of towns without much fear of man. It is very voracious, and nothing less than the carcase of a horse or a cow can make a meal for them when they are many together. It is not uncommon to see them assemble with the gulls, and greedily devour the carcase of a whale which has been cast ashore, and they will even pursue weak and wounded game.

Cathartocarpus (*καθαιρω*, to purge; *καρπος*, fruit).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. There are several species, all of them trees, and not unlike the common laburnum when in flower. The legume containing the seeds, is long, cylindrical, and woody, many celled and the cells filled with pulp. The species best known is *C. fistula*, which at one time belonged to the genus *Cassia*, and is called the purging cassia or pudding pipe-tree. It is a tree from thirty to forty feet high, and the pod is from nine inches to two feet and upwards in length. It is supposed to have been originally a native of Africa, but it is now naturalized in India, China, the West Indies, and South America. The pulp has a sweetish flat taste and is separated by boiling the pod in water, straining the fluid and then evaporating it to the consistence of a thick extract. It acts as a gentle laxative, and though now seldom used alone it is employed in the composition of other medicines. The horse-cassia, *C. Javanicus*, is a native of Java. Its legumes are two feet long, and contain a black cathartic pulp which is used as a horse medicine in the East Indies.

Catlinite.—An argillaceous mineral of a red colour, consisting of clay stone porphyry, from the Sioux country, North America. It is called pipestone by the Indians, and is used by them for making tobacco pipes.

Catodon.—See CATODONTIDÆ.

Catodontidæ. *The Toothed Whales.*—A family belonging to the class *Mammalia*, and order *Cete* or *Cetacea*. They are distinguished from the balænidæ by their possessing teeth in the lower jaw. Two genera of this family are well known; *Catodon* and *Physeter*. The most remarkable and most valuable species of all is the spermaceti whale, *Catodon macrocephalus*. It is also known by the names of the sperm whale and the blunt headed cachalot. In length, it comes, of all the whales, next to the rorqual, *Balænoptera physalis*, and in bulk generally perhaps exceeds it, while in commercial value it almost equals the Greenland whale, *Balæna mysticetus*. The head constitutes a third of the whole length of the body, and possesses only one

spiracle or blow-hole. In the right side of the nose is a large, almost triangular shaped cavity,

Catodon macrocephalus—Spermaceti Whale.

called by whalers the *case*, adapted for the purpose of secreting and containing an oily fluid which after death concretes into a granulated substance of a yellowish colour called spermaceti. More than a ton, or upwards of ten large barrels of this substance is often contained in the *case* of a single whale. The mouth is enormous, and the gullet is large enough to admit the passage of the body of a man. The head, though large, is very light. The skin is smooth and nearly black, and immediately beneath this lies the blubber or fat, which varies from eight to fourteen inches in depth, according to the part of the body. This blubber is called the *blanket* by the whalers, and when melted down furnishes the sperm oil. A large whale will yield eighty barrels of oil and sometimes more. The sperm whale has quick sight and hearing, and the whalers have some difficulty in approaching it. Its length is about eighty feet. Their chief food consists of cuttle fishes or squids, and small fishes. The sperm whales are gregarious, and they go in herds or "schools" as they are called, of 500 or 600 individuals. They are found principally in the warmer seas, within or upon the verge of the tropics. They breed at any season of the year, and have only one young one at a time. The *Physeter tursio*, or black fish, which inhabits the North Sea, and has occasionally been thrown on the coast of Scotland, produces spermaceti also according to Sir Robert Sibbald. The length of this species appears to be about fifty-two feet, and its head is about half the size of its body. Sibbald tells us that we may judge of its size by the fact, that he saw four men inside the cranium at one time, extracting the brain. Fossil remains of one or two species of *Physeter* have been found in the tertiary beds of Great Britain.

Cat's Eye.—A precious stone from Ceylon and Malabar. It is a variety of opal, and has a peculiar internal reflection like the eye of a cat, caused by thin filaments of asbestus interspersed.

Caulerpa.—A genus of cryptogamic plants belonging to the nat. ord. *Fuci*; natives of warm southern climates.

Caulerpites.—A group of fossil cryptogamic plants belonging to the *Fuci*, and allied to the recent genus *Caulerpa*. There are many species occurring in the different marine formations. Seven are found in the oolites.

Caulophyllum.—A genus of plants. See BERBERIDACEÆ.

Cavia. *The Cavy.*—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Hystricidæ*. The common guinea pig or restless cavy, *C. cobaya*, is the best known species of the genus. Originally a native of South America, this little animal is now domesticated in this and other European countries, being often kept in houses under the supposition that its odour drives away rats. It is cheerful and lively, but very shy and timid, running about continually and making a grunting kind of noise. This and its coarse bristly hair have obtained for it its name of guinea pig. It spends its time in eating, sleeping, and playing with its companion. In its wild state it lives in societies, inhabiting excavations in dry lands covered with low brushwood, where it remains concealed during the day, coming forth in the evening to seek its food. This is the *C. aperœa*, or rock cavy of authors, inhabiting Brazil, and being there hunted for its flesh, which is considered superior to our rabbits. They are harmless, inoffensive creatures, and were it not for their great fertility, would soon be exterminated. They breed several times a-year, sometimes every two months, and the usual litter consists of six, eight, or ten. The gray rock cavy or moko, *Kerodon Kingii*, is another closely allied species, a native of Patagonia, and considerably larger than the guinea pig. It has a longer head and is of an olive-gray colour.

Caviar or **Caviare.**—A substance prepared from the salted roes of two species of sturgeon found in the Danube and Volga. The Uralian Cossacks are famed for making excellent caviar. The roe is washed in vinegar, spread out on a table, salted and pressed in a bag; after which it is left for some time in a vessel, having a hole at the bottom to let any moisture that may drain off escape. It is then packed in small casks or kegs. It forms a very considerable article of commerce at Astrachan. It is consumed in large quantities in Russia, and is exported to Italy, where it is commonly eaten spread upon bread or bread and butter.

Ceanothus.—A genus of dicotyledonous plants belonging to the nat. ord. *Rhamnaceæ*. There are several species, all of which are shrubs and natives of America. *C. Americanus*, a native of New Jersey and other parts of North America, is known as the New Jersey tea or red root. It is a pretty ornamental shrub three or four feet high, with a profusion of flowers and a large red root. The leaves are sometimes used as tea, and during the war of independence were commonly substituted for the genuine article, under the name of "Pong-pong tea." An infusion of the twigs is used as an astringent, and a dye is obtained from the plant which tinges wool of a fine strong nankin-cinnamon colour.

Cebidæ. *The Monkeys of the New World.*—A family of quadrumanous animals peculiar to America. They differ from the monkeys of the Old World, *Simiidæ*, in their nostrils being wide apart, and as it were opened on the sides of the nose, and in having no cheek pouches. They never have any callosities on their rump, and their tails which are long and strong, are generally prehensile and used as a fifth hand to assist them in climbing. They have four more grinders than the others, thirty-six in all, and the thumbs of the anterior hands are not opposable. Several genera belong to this family, such as ATELES, of which we have already spoken, MYCETES, NYCTOPITHECUS, PITHECUS, *Cebus*, and others. The species of the genus *Cebus* are of considerable number, ten or eleven of which may be seen stuffed in the British Museum. They have a round head, and their long tail entirely covered with hair. They live on fruits and insects, are lively and gregarious, and very playful when young. *Cebus capucinus* is a native of Guiana, and is called the capuchin monkey, from the hair on the crown of the head and upper part of occiput being black, and forming a well marked monk's cap, the rest of the hairs being grayish-white. *Cebus apella* is called the weeper monkey, from its peculiar plaintive cry, and *Cebus fatuellus* is known as the horned monkey or capuchin, from the hair of its forehead being disposed in black tufts on each side. Amongst the other species, some exhale a strong odour of musk, are quick and lively in their motions, and are of a mild and gentle disposition. Such is *Cebus hypoleucus*, or white throated sapajou, a native of tropical America, and which may be taken as the type.

Cebrionidæ.—A family of insects belonging to the order *Coleoptera*, the species of which are natives, for the most part, of the south of Europe and the north of Africa. Little is known of their habits, but some of them are remarkable for the beautifully pectinated antennæ, which the males more particularly possess. The females of *Cebrio gigas* appear to live in the ground, being seldom seen above the surface; and at the period of coupling they protrude a long horny tube, the extremity of which contains the organs of generation, and which they also employ to introduce the eggs to a proper depth under ground.

Cecidomyia (κηκις, excrescence; μυια, fly).—See CECIDONYIDÆ.

Cecidomyidæ.—A sub-family of insects belonging to the order *Diptera*, and family *Tipulidæ*. The insects belonging to this family are very small, and reside, in their preparatory states, in gall-like excrescences which they produce upon various plants. The females deposit their eggs in the young sprigs, the leaves or flowers, which they pierce by means of their sharp-pointed ovipositor. Where this puncture is made, a gall or excrescence takes place, which grows sometimes to a large size, serving both as a nest and food for the young larvæ. Some of the species form these galls upon trees, as pines or willows; others upon gramineous plants, such as wheat, and cause extensive injury, when they are numerous, to the crops both in England, continental Europe, and North America. The wheat-fly, *Cecidomyia tritici*, is the European species. The female deposits her eggs in the centre of the corolla, where the larvæ are hatched, thus preventing the impregnation of the plant, and destroying a considerable portion of the crop. The American species, *Cecidomyia destructor*, is better known by the name of the Hessian fly. It is still more destructive than the other, attacking the lower part of the stem of the wheat. Deriving its nourishment from the sap which it appears to take by suction, it weakens and impoverishes the plant, and thus causes it to fall down or to wither and die.

Cecropia.—A genus of plants. See ARTOCARPACEÆ.

Cecrops.—A genus of parasitic crustacea. See CALIGUS.

Cedrela.—A genus of plants. See CEDRELACEÆ.

Cedrelaceæ. *The Mahogany Tree family.*—A nat. ord. of dicotyledonous plants, the species of which are timber trees, the wood being usually compact, scented, and beautifully veined. There are several genera, and about twenty-five species have been described. *Cedrela odorata* is a tree seventy or eighty feet high, a native of the West Indies, with a rough bark and leaves nearly three feet long, smelling strong, when fresh, of assafœtida. The wood itself, however, has a fragrant odour, which has obtained for it, from the inhabitants, the name of cedar wood. It is soft, and is hollowed out into canoes, some of which are forty feet long and six broad. From its odour being offensive to insects, it is also used for making chests of drawers and other furniture. *Cedrela Toona*, or bastard cedar, is a native of the East Indies, and has an erect trunk of great height and size. The bark, which is smooth and gray, is a powerful astringent, and has been used as a substitute for Peruvian bark. The bark of *Soymidia febrifuga*, a native of Java, is also a powerful astringent, and is said to have a better effect on some of the fevers of India than cinchona itself. The wood of *Chloroxylon Swietenia*, a tree growing in the East Indies, is the satin wood of commerce, a remarkably close-grained, heavy, durable wood, of a deep yellow colour, and coming nearer to boxwood than any other tree. An essential oil called wood oil is obtained from it. The valuable timber called mahogany is the produce of *Swietenia Mahogani*, a majestic and beautiful tree growing in the West Indies and Central America. The principal importation of mahogany is from Honduras and Campeachy. That which is imported from the islands, such as Cuba and Hayti, is called Spanish mahogany, and is the most valuable. Mahogany was used

for repairing some of Sir Walter Raleigh's ships at Trinidad in 1597, but was not introduced into England till 1724. Large prices have occasionally been given for fine logs of this wood. Not many years ago, Messrs. Broadwood, the celebrated piano-forte manufacturers gave the enormous sum of £3,000 for three logs! They were the produce of a single tree, each log being about fifteen feet long and 38 inches square, and when polished, the wood reflected the light in the most varied manner, like the surface of a crystal. The quantity of mahogany imported to this country is very great, and some years ago the duty upon foreign mahogany was very high. In 1832, the duty produced £45,405; in 1852, the quantity imported amounted to 41,090 tons, of which only 2,755 tons were re-exported.

Celastraceæ. *The Spindle Tree family.*—A nat. ord. of dicotyledonous plants inhabiting the warm parts of Europe, North America, and Asia, and the Cape of Good Hope. They are small trees or shrubs, but none of them of much economical importance. The commonest species of the family is the spindle tree, *Euonymus Europæus*, a native of Great Britain. The fruit and inner bark are said to be emetic and purgative; the young shoots when charred, are used to form a particular kind of drawing pencil; and in England the wood is made into butchers' skewers. The bark of *Euonymus tingens* furnishes a yellow dye. Some of the species of *Celastrus*, as *C. scandens* and *Senegalensis*, are said to be purgative and emetic; and the *C. venenatus* is reckoned poisonous, and is reported to inflict the most dangerous wounds. The fruits of *Elæodendron ruber* are eaten at the Cape of Good Hope, and the seeds of some other species yield a useful oil.

Celastrus.—A genus of plants. See CELASTRACEÆ.

Cellulares.—A synonyme of the sub-class of plants called THALLOGENÆ.

Celosia. *The Cockscomb.*—A genus of plants. See AMARANTHACEÆ.

Celtis. *The Lote* or *Nettle Tree.*—A genus of plants belonging to the nat. ord. *Urticaceæ*. *C. australis*, or European nettle tree, is a native of the south of Europe, and is a tree growing to the height of forty or fifty feet. The wood is of a dark colour, remarkably hard, compact, and heavy. It is tough and flexible, and therefore well adapted for making shafts for carriages, &c. In durability, strength, and beauty, it is almost equal to box and ebony, and is capable of receiving a fine polish. The ancients used it for making flutes and other musical instruments. The fruit of *C. occidentalis*, a native of Pennsylvania, is about the size of a small cherry, is of a deep purple colour when ripe, and has a sweet taste. It is sent to England.

Cenchris.—A genus of serpents. See CROTALIDÆ.

Centaurea.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Cynarocephalæ*. This is an extensive genus of plants containing about 200 species scattered over the whole surface of the globe, though very few are of much use to man. They are divided into different sections according to the structure and disposition of the scales of the involucre. Several species are cultivated in our gardens, and about eight are natives of Great Britain. *C. Cyanus* or blue bottle, as it is commonly called, is very common in our cornfields. It is said to possess opthalmic properties, and in France is called "Casse-lunettes." *C. Jacea* is considered good forage for cattle. *C. calcitrapa*, or common star thistle, is a native of England and other temperate parts of Europe. The plant and root are both bitter, and are said to be sometimes used by brewers instead of hops. They have likewise been recommended as a substitute for quinine. The leaves are eaten by the Jews with their paschal lamb. The root is considered as a good diuretic.

Centetes. *The Tenrec.*—A genus of animals belonging to the class *Mammalia*, order *Feræ*, family *Talpidæ*; and very nearly allied to the hedgehogs, *Erinaceus*. They differ from them in having small cutting teeth, in being covered with spiny bristles intermixed with silky hairs, and in not being able to roll themselves up so completely in a ball. Three species are described, all natives of Madagascar. *C. setosus*, or silky tenrec, is the largest, measuring from ten to twelve inches in length from the tip of the nose to the rump. It has no tail, but has a long pointed snout. The spines are chiefly confined to the forehead, temples, upper and back part of the head, upper part and sides of the neck and shoulders; the back, rump, and sides of the body being clothed with silky hairs. These animals live in burrows on the water's edge, where they pass the greater part of their time in sleep during the hottest months. They are nocturnal, hunt for food in the mud, and spend more time in the water than on land.

Centriscus.—A genus of acanthopterygious fishes belonging to the family *Fistulariidæ*. They are distinguished by having a long tubular snout, and one species, *Centriscus scolopax*, which occasionally visits our shores, is known by the name of the trumpet fish or sea snipe, in consequence. It is said to be good eating.

Centronia.—A synonym of RADIATA.

Centropomus.—A genus of acanthopterygious fishes belonging to the family *Percidæ*. There is only one species known, *C. undecimalis*, the sea pike, a fish of considerable size, weighing sometimes as much as 25 lbs. It frequents the mouths of great rivers in South America, and forms there a considerable article of consumption.

Centropristes.—A genus of acanthopterygious fishes belonging to the family *Percidæ*. One of the species is good eating. It is called

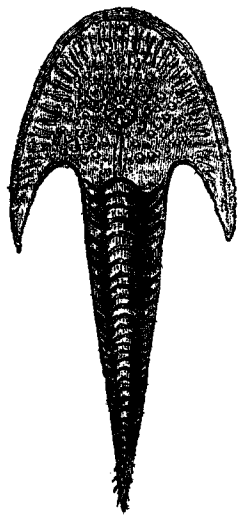
the black perch or black bass, *C. nigricans*, and is abundant in the rivers of the United States, where it is much esteemed.

Centropus.—A genus of scansorial birds belonging to the family *Cuculidæ*. The species are distinguished by having a long pointed thumb nail as the larks, and a rigid spinous plumage. They are called the *pheasant cuckoos*, and are natives of Africa and India. They build their nests in the holes of trees, feed principally upon grasshoppers, run very quickly among reeds and such like herbage, and seldom take wing. Their flesh is rank, and not good eating. See CUCULIDÆ.

Centunculus.—A genus of dicotyledonous plants belonging to the nat. ord. *Primuiaceæ*, or primrose family. There is only one species known, *C. minimus*, and it is a small herbaceous plant, with a weak prostrate stem, alternate leaves, and pale rose coloured flowers. It is a native of Great Britain, and is generally known as the *bastard pimpernel*.

Cephaelis.—A genus of dicotyledonous plants belonging to the nat. ord. *Cinchonaceæ*; containing upwards of thirty species, several of which are remarkable for the emetic qualities their roots possess. They are natives of the warm parts of South America. The most important species, and the best known, is the *Cephaelis Ipecacuanha*, from the roots of which the brown ipecacuanha of commerce is obtained. It is a small, weak, almost prostrate shrub, growing in the forests of Brazil in close, damp, shaded places, and flowering in the months of January and February. The roots are twisted, from four to six inches long, about as thick as a goose quill, and separating into rings which are about half as thick as the whole diameter of the root. They break with a resinous fracture and are inodorous, but the taste is bitter, subacrid, and extremely nauseous. Their active principle is an alkaloid called *Emetine*, of which they contain from one to sixteen per cent. Ipecacuanha was first introduced into Europe in the time of Louis XIV., and was brought into use at the Hotel Dieu, in Paris. The celebrated Helvetius employed it in dysentery, and it was so much esteemed at the time, that Louis XIV. rewarded him with a present of £1,000. The Purl and Coroado Indians are the chief collectors of this drug, which furnishes them with a valuable means of barter with Europeans. Besides this kind of ipecacuanha, which is the true officinal kind, there are several spurious sorts obtained from plants of the same family, with which it is adulterated. The striated or black Peruvian ipecacuanha, is the produce of a species of Psychotria, *P. emetica*, and the white or amylaceous ipecacuanha is furnished by a species of Richardsonia, *R. scabra*, a native of the provinces of Rio Janeiro and Minas Geraes.

Cephalaspis.—A genus of fossil fishes belonging to the placoid section, found in the old red sandstone formation. Two species occur in Great Britain, remarkable for large heads like the anterior part of a trilobite, and narrow, jointed bodies. The head of *C. Lyellii* resembles very much the butterman's cheese knife.



Cephalaspis Lyellii.

Cephalopoda. (κεφαλη, head; πους, foot).—A class of animals belonging to the sub-kingdom *Mollusca*; and characterized by having locomotive organs in the form of muscular tentacles, generally called *arms* or *feet*, attached to the head. This class contains the largest animals of the sub-kingdom and the most advanced in organization, as they possess in a higher degree than any others the senses of sight, touch, and hearing, and are provided with more powerful means of prehension and locomotion. They have a large head armed with strong jaws like a parrot's beak, and like a bird's mandibles acting vertically; large eyes placed on the sides of the head, and a large and fleshy tongue. The nervous system is more concentrated than in the other mollusca, and the brain is protected by a cartilage. The respiratory organs consist of two or four plume-like gills, placed symmetrically on the sides of the body in a large branchial cavity opening forwards on the under side of the head, and in the middle of this opening is placed the syphon or funnel. The sexes are always distinct, but the males are much less numerous than the females, and in many species are at present unknown. They are all marine, and change the colour of their skin with great rapidity. Amongst them are many of great interest, and many which have been celebrated by ancient poets and naturalists. Some are gregarious in their mode of life, living in large troops, and swimming in con-

cert; others live isolated, dwelling alone in their retreats, from which they sally forth to seek their prey. Some have an external shell, and this is either simple or chambered. Others have the shell internal, and this is either shelly or composed of a horny substance. Others, again, have no shell at all. The recent species are numerous, but the extinct fossil ones still more so. The genera are arranged in two orders, according to the number of their gills. The animals of the first order, *Dibranchiata*, have two gills, and with the exception of *Argonauta*, have an internal shell. This order contains the OCTOPODA and DECAPODA, and is synonymous with the *Acetabulifera* of some naturalists, and nearly so with the *Sepiophora* of Gray. The second order, *Tetrabranchiata*, contains those species which have four gills, and are protected by an external shell. In it we find the NAUTILIDÆ, ORTHOCERATIDÆ, and AMMONITIDÆ; and the order is synonymous with the *Tentaculifera* of authors, and nearly so with the *Nautilophora* of Gray.

Cephaloptera. *The Horned Ray.* — See RAHIDÆ.

Cephalopus. *A genus of Antelopes.*—See ANTILOPEÆ.

Cerambycidæ.—A family of coleopterous insects belonging to the group *Longicornes*. The number of species is very considerable, and they are now arranged under many genera. They are generally of a large size, of an elongate and elegant form, and particularly characterized by having very long antennæ. The greater part possess brilliant lively colours, beautifully variegated. The long antennæ are divided into numerous joints, and in some are quite smooth, in others hairy, and in a third set are adorned with tufts or pencils. In one set the elytra are very short, and do not cover the abdomen; in another set they are large, and cover the whole abdomen and wings. Several are remarkable for the emission of a fragrant odour, not unlike that of attar of roses, and this in some is so powerful, that they may be discovered by it at a considerable distance. The abdomen of the female is provided with an ovipositor of considerable length, by means of which they can insert their eggs into crevices of trees or plants, in the interior of which their larvæ live and are hatched. The perfect beetles are found in forests, hedges, or woods, sitting upon trees or plants, to which they do no damage, though the larvæ are often very destructive, especially those of the larger species. When young, they live under the bark, but when they arrive at a more adult state, they perforate the trunk of the tree. The genus *Cerambyx*, which originally contained nearly all the known species, is now limited to those in which the antennæ have eleven smooth joints, and the prothorax is very rough or pleated transversely above. The larvæ of this genus do not acquire their full size till they are three years old, soon after which they undergo their transformations. *Cerambyx heros* is one of the largest European species, and its larvæ do much injury to the oaks, in the trunks of which they hollow out large excavations. This larva is believed to be the *cossus* of the ancients, by whom it was considered a great dainty as an article of food. *C. moschatus*, or musk beetle, is the only British species of the scented group. The odour is not at all like that of musk, though its name implies as much; it is more like attar of roses. It is abundant on willows in the south of England and in the neighbourhood of London, and the fragrance (more powerful in the female) has been supposed, like the light of the glow-worm, to be intended to attract the male. The larvæ of several species of *Saperda* have been noticed, feeding on the pith of the pear tree, the plum, the poplar, and the oak. *Lamia amputator*, a West Indian species, has been described as doing much damage to the mimosa trees. The perfect insect of this species is unfortunately as destructive to the tree as its larvæ; for while the latter excavate the branches with labyrinth-like passages, the former gnaws them off, biting circularly round their axis.

Cerambyx.—See CERAMBYCIDÆ.

Cerapodina.—A genus of crustaceans belonging to the order *Amphipoda*. It is nearly allied to the preceding genus, and like it inhabits a tube, which, however, is papyraceous, and open at both extremities. The only species yet known, *C. abdita*, is found in the open sea, off the coast of Brazil.

Cerapus (κέρας, a horn; πους, a foot).—A genus of crustaceans belonging to the order *Amphipoda*. It contains two species, both of which are natives of North America. The typical species is *C. tubularis*, a very small but singular creature (about six lines long), which inhabits a membranous tube like that of the larvæ of the *Phryganeæ*, from which project only the head, antennæ, and two first pairs of feet. This tube the animal drags after it wherever it goes. It is found in abundance on the coasts of the United States, living amongst fuci and sertulariæ, upon the latter of which it appears to feed.

Cerasite.—A native chloride of lead, composed of eighty-three parts of lead and fourteen of chlorine. It is found in the Mendip Hills, Somersetshire.

Cerastes (κέρας, a horn).—A genus of serpents belonging to the family *Viperidæ*. *C. nasicornis*, or horned viper, is a native of Western Africa, and is remarkable for its repulsive physiognomy, and for possessing two horns placed upon its snout. It is about three feet long and nine inches in circumference. The natives dread this viper more than any other, as it is exceedingly venomous. It is slow in its movements, and does not attack man unless when trodden upon or opposed in its progress. It inhabits

both high and low grounds, feeding on rats, the smaller reptiles, and fresh water fish that inhabit the marshes. Its vicinity is known by a peculiar sound, somewhat like a suppressed groan; this is succeeded by a hissing or blowing noise. The former is a warning that every one acquainted with its habits remembers, and knows well the necessity of heeding; the latter indicates a readiness to bite. When it is about to make an attack, it flattens its head and body, retracting itself upon its tail, and then with its mouth enormously distended, its fangs protruded, and eyes flashing fire, it darts upon its prey. It does not spring, but using its tail as a fulcrum, it darts forwards. The poison is very intense, generally proving immediately fatal, though sometimes hours will elapse. Recovery is seldom known to take place. The native treatment for the bite of this and other serpents is to *suck out* the poison, make a free incision, and apply the juice of a particular plant to the wound.

Cerasus. *The Cherry.*—A genus of plants, deriving its name from Cerasus, a city of Pontus, whence the tree was brought by Lucullus about half a century before the Christian era. See AMYGDALEÆ.

Ceratina.—A genus of insects belonging to the order *Hymenoptera*, and family *Apidæ*. The female excavates a cylindrical burrow of considerable length in the dead branch of a bramble or a sweet briar, which she divides into eight or nine cells. In each cell as it is formed she deposits an egg, and furnishes it with a portion of honey for the food of the larva when hatched. One or two species are natives of England.

Ceratonia.—A genus of apetalous dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. *C. siliqua*, the only species, is a native of the countries skirting the Mediterranean, and is called the carob tree, or St. John's bread. It is an evergreen tree of considerable size, from fifteen to twenty feet high, and is almost the only tree that grows in the island of Malta. Its fruit when ripe, has a tolerably sweetish pleasant taste, and is eaten in times of scarcity by the country people. It is sent from Palestine, where it grows abundantly, to Alexandria in ship loads, and from thence across the Mediterranean as far as Constantinople, where it is sold in all the shops. The pulp mixed with liquorice root, dry raisins, and several other kinds of fruit forms the sherbet of the Turks. It is supposed by many writers (though in all probability erroneously), to have been the food of St. John in the wilderness—the *ακρίδες*, or locusts, being believed by some of the fathers to be a vegetable substance, and the *μελι αγριον*, wild honey, to be the saccharine matter of the pod of this plant. The pods are given to horses and cattle, and it is considered probable by some naturalists that they were the *husks* mentioned by our Saviour in the parable of the prodigal son. The bark of the tree possesses great astringency, and may be used as a substitute for oak bark in tanning hides.

Cerbera.—A genus of plants, synonymous with TANGHINIA.

Cerberus.—A genus of snakes, belonging to the family *Hydridæ*. Four species are known living in the fresh waters of India, Borneo, the Philippines, and Australia. *C. cinereus* is known in India under the name of the karoo bokadam. It is a harmless snake, being destitute of poison fangs.

Cercaria.—A genus of parasitic intestinal worms. The genus *Cercaria* was formerly included among the infusoria. It is now ascertained to be an immature form of the fluke, *Distoma*, a genus of *Entozoa*, belonging to the order *Trematoda*. They are found in the viscera of fresh water snails. See ALTERNATION of GENERATIONS.

Cerceris.—A genus of insects. See CRABRONIDÆ.

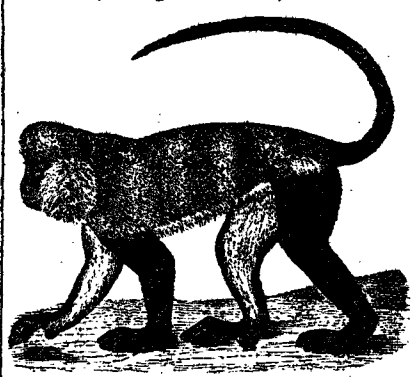
Cercis.—A genus of dicotyledonous plants, belonging to the nat. ord. *Leguminosæ*. There is a species of this genus common on the shores of Asia Minor and the East, called the red bud, which is remarkable from the manner in which it flowers. The flowers, of a bright pale red, burst out in early spring from the branches, and the trunk itself, before the leaves appear, piercing the thick strong bark nearly down to the root in a singular manner, and producing a very beautiful appearance. These *red buds* are gathered and used with other raw vegetables by the Turks and Greeks in salads, to which they give an agreeable colour and taste. This species, *C. siliquastrum*, is a tree of some size, and the tradition in the East is, that it was upon it that Judas the traitor hung himself. It is hence called the Judas tree.

Cercocebus.—A genus of monkeys. See CERCOPITHECINA.

Cercopidæ.—A family of insects belonging to the order *Homoptera*. It is very extensive, containing many species of small size, and some most singular creatures. In one sub-family, the *Cercopides*, the prothorax assumes most remarkable forms, and exhibits an almost endless variety and grotesqueness of form. The legs are fitted for leaping, and the species are destitute of sonorous organs. They are often beautifully varied in their colours, and are constantly found amongst plants, and on trees, upon the juices of which they subsist, in all their states, by introducing their rostrum into the stems or leaves. The larvæ are entirely destitute of any appearance of wings, and the pupæ have them only rudimental. One of the best known species of the family is the *Aphrophora spumaria*, commonly known by the name of *cuckoo spit* or frog-hopper. This is a small species, frequenting garden plants, the larva and pupa of which invest themselves with a frothy excrementitious secretion in which they lie completely hid till they complete their trans-

formations. The frothy matter is vulgarly supposed to be really the spittle of the cuckoo—hence its name. This spittle was formerly called "witches' butter," and in 1670, at a place called Mohra, in Sweden, was constituted one of the proofs that consigned numbers of women and children to the last penalties of the law as being witches! In India, some of the species are used by the ants instead of aphides, for obtaining a supply of saccharine fluid. A species of tettigonia, *T. Vitis*, is a very destructive insect in America. They live upon the leaves of the vine, sucking the juices, their beaks being thrust through the under surface of the leaf. The injury caused by them is sometimes very great.

Cercopithecina, (κερκος, tail; πιθηκος, monkey).—A group of quadrumanous animals belonging to the family *Simiidæ*, and composed of monkeys of a rather slender form, and possessing long limbs, a long tail, and large cheek pouches. There are a good many species described, all of them either natives of Africa or the adjoining parts of Asia. They differ considerably from each other in form and manners. Some are ill-disposed animals in their adult state, and difficult to tame; others are more gentle and easily domesticated. In general, they are very lively, petulant, and capricious. They are either constantly in motion or asleep. They exhibit great curiosity and extreme mobility of impressions, passing from their natural state of gaiety in an instant to one of sadness, and from that to anger without any apparent object or cause. At one moment they will caress a comrade with the greatest fondness, and at the next exhibit the utmost degree of anger and pursue it as an enemy. They will show the deepest anxiety to possess some object, express much joy in receiving it, then in an instant let it drop from their hands, or perhaps break it with the greatest rage. Climbing with wonderful facility, these monkeys will run along a vertical surface, if there are any small projecting parts for them to lay hold of, as fast as an agile quadruped will do on a plane horizontal surface. They are great leapers, and clear immense distances with ease, throwing themselves from branch to branch, and from one tree to another with the utmost dexterity. They live in large troops in the forests, and it is said they place a sentinel to give warning of the approach of an enemy. When any such appears they assemble at the top of a tree, and hurl fruit, branches, and even their excrement at the intruder, making at the same time a loud noise and vehement gesticulations. The negroes are afraid of them in such cases, and even elephants and other large quadrupeds are obliged to beat a retreat from these furies. Serpents are their most redoubtable enemies, as they creep along the branches silently at night and surprise them asleep. Their chief food consists of fruits, roots, and leaves; and during the fruit season, they sally forth into gardens and orchards, where they commit great devastation, eating as much as they can, and then cramming their large cheek pouches to carry off with them. They feed also upon honey, insects, and sometimes mollusca and eggs of birds. The thumbless monkeys, *Colobus*, have no thumb on the fore hand, and are confined to Africa. The guereza, *Colobus guereza*, is an inhabitant of Abyssinia, and the skin is used by the natives to form shields. The full bottom or king monkey, *Colobus polycomus*, is remarkable from having its head and shoulders covered with long, coarse, flowing hair, like a full-bottomed periwig. The body, arms, and legs are of a glossy black, and its long tail is of a snowy whiteness. It is a native of Sierra Leone. The *Cercopitheci* are found both in Africa and Asia, and are distinguished by having only four tubercles to the hinder molar tooth on each side of the lower jaw. The spotted or diana monkey, *Cercopithecus Diana*, is a native of Western Africa, and is one of the most playful and lively of the whole tribe. It has a long white beard, and a crescent of white hairs on the brow. The mona, *Cercopithecus mona*, is a native of



Cercopithecus mona—The Mona Monkey.

Guinea, and by the negroes there is called *monne*, from whence it is said is derived our English word, *monkey*. The mangabeys, *Cercocebus*, are natives of Africa, and have five tubercles on the lower hinder grinders, and elongated hairy tails. *Cercocebus Œthiops* is a native of Madagascar, and is remarkable for its white eyelids — hence its name white-eyelid monkey. The bonnet apes, *Macacus*, are inhabitants of Asia, and have short tails and very prominent eyebrows. The bruh, *Macacus nemestrinus*, is a native of Sumatra, where it is said to be made useful to the islanders, by being taught to ascend the cocoa nut trees and collect the ripe nuts. The Barbary ape, *Macacus Inuus*, is the only monkey found in Europe. It inhabits Egypt and Barbary, and has become

located on the rock of Gibraltar, where it is said to be very common. The tail of this species is reduced to a mere tubercle. When young it is good-tempered, lively, and intelligent, but as it gets old it becomes ill-tempered, fierce, and mischievous. This is the species so common in this country, carried about by itinerant musicians and others. The *talapoin* is a native of Western Africa, and in captivity is remarkable for its grace, and the gentleness and softness of its disposition. Along with another closely allied species it has been removed by some naturalists from the genus *Cercopithecus*, and formed into a new genus called *Miopithecus*.

Cercopithecus.—A genus of monkeys. See CERCOPITHECINA.

Cereopsis.—A genus of birds belonging to the order *Anseres*, family *Anatidæ*, and subfamily *Anserinæ*. The species upon which the genus is founded is the Cereopsis goose, *C. Novæ Hollandiæ*, a native of New Holland. It is about the size of a common goose, and resembles it in general appearance, with the exception of having longer legs, and the bill being covered with a broadly expanded cere. When first discovered, these geese were very tame, and allowed themselves to be taken by the hand. They are good eating, and indeed are said to be more delicate than our common geese. They feed upon grass and rarely take to the water; their voice is deep, hoarse, and clanging.

Cereus. *Torch Thistle.*—A genus of plants. See CACTACEÆ.

Cerithidea.—A genus of shells. See CERITHIIDÆ.

Cerithiidæ.—A family of mollusca, containing numerous species, the animals of which are phytophagous, and are generally found crawling upon rocks covered with fuci and other plants upon which they feed. The shells are turrited, elongated, many whirled, and frequently varicose. The aperture is terminated at the base by a short canal, which is truncated or recurved, never notched. About 100 recent species have been described, while not fewer than 460 have been found fossil. Some of the species are marine. The genus *Cerithium* contains many, the greater number of which inhabit the tropical seas, though they are most widely distributed. They have a small aperture with a tortuous canal in front, and an expanded lip. The operculum is ovate. Other species are fluviatile or estuary. The genus *Potamides* is the type of the fresh water group; the shells are like that of *Cerithium*, but have no varices, and the mouth is rounder; while the operculum is orbicular. They are found in Africa and India, and are very common in the mud of the Indus. The sub-genus *Cerithidea* inhabits salt marshes, mangrove swamps, and the mouths of rivers, and the animal is as much out of water as in it. *Cerithidea telescopium* is peculiarly abundant in the river Hooghly, on Saughur Island, and near Calcutta; the shells are so numerous as to be used for burning into lime. The sub-genus *Pyrazus* is found in Australia, as well as in India. The canal in this genus is straight and often tubular. Many fossil species occur in the eocene formations.

Cerithium.—See CERITHIIDÆ.

Cermatilda.—A family of myriapods. See CHILOPODA.

Cerocoma (κέρας, a horn; κόμη, hair).—A genus of heteromerous coleoptera belonging to the family *Cantharidæ*. The species have great affinities with the cantharides, but differ in the structure of their antennæ. Seven or eight species only are known, found on the coast of the Mediterranean and North Africa. They fly with great swiftness, live on flowers, and are distinguished by great brilliancy of colour. They possess the vesicating properties of the cantharides, but are not sufficiently numerous to be of any commercial value. The larvæ are not known, but are believed to be parasitic like those of the meloe.

Ceroplatus (κέρας, a horn; πλατύς, broad).—A genus of dipterous insects belonging to the family *Tipulidæ*, and sub-family *Mycetophilides*, or fungus eaters. The perfect insects are distinguished chiefly by their antennæ, which are compressed and broad in the middle. The larvæ inhabit the agaric of the oak and other trees. Those of *C. tipuloides* live on the under side of the boletus angulatus and are covered by a viscid secretion. They live in societies of eight or ten individuals, each of them spinning a web in which it invests itself, and by which it is attached to the fungus. In this covering they enter into the pupa state, from which they emerge perfect insects at the end of twelve or fifteen days. The larvæ of *C. carbonarius* are found in society also, and in great numbers, but they all live and undergo their transformations under a common web.

Ceroxylon.—A genus of palm trees. *C. Andicola*, the wax palm of South America, is a majestic tree, 180 feet high, growing among the most rugged precipices of the Andes, below the snow capped mountains of Quindiu. The trunk of the tree is distinctly marked by rings, caused by the fall of the leaves, which are from eighteen to twenty feet long. The spaces between the rings are quite smooth and covered with a thick coating of wax and resin. This matter consists of two-thirds resin and one-third wax, and when melted with a third of fat, makes excellent candles.

Certhia.—See CERTHIINÆ.

Certhiidæ. *The Creeper family.*—A family of birds belonging to the order *Passeres*, and tribe *Tenuirostres*. This is an extensive family, and has lately been divided into no less than seven sub-families, each containing several genera.

Certhiinæ. *The True Creepers.*—Is one of

these sub-families containing the genus *Certhia* and several others. The species of this sub-family are birds which are for the most part adapted to live upon the trunks and branches of trees, and to feed upon insects which infest the bark. They cling by their feet to the perpendicular surface, resting upon the stiff quills of their tails, and creep from the base to the summit of the stem with short jerking movements, searching every crevice as they ascend. The common or true creeper, *Certhia familiaris*, is one of the smallest British birds, weighing only from two to five drachms. It is restless and active, running up the bark of trees with as great ease as a fly walks upon glass. Its note is monotonous, resembling *zich, zich*, repeated deliberately. It breeds in the hollows of old trees. The wall creeper, *Tichodroma muraria*, is a native of continental Europe, building its nest in the cliffs of lofty rocks. It clings to the vertical pieces of rocks, and to the walls of old buildings, as readily as the common creeper does to trees.

Cervantesia.—A genus of plants belonging to the nat. ord. *Santalaceæ*, or sandalwood family; and named after the celebrated *Cervantes*. *C. tomentosa* is a native of Peru, and its seeds are eaten by the inhabitants in the same manner as almonds in Europe.

Cervina. *The Deer family.*—A tribe of ruminating animals belonging to the family *Bovidæ*. In this tribe the horns, or *antlers*, are quite bony, and not enveloped in a horny sheath like the oxen and goats, &c. They are deciduous, falling off annually, in the females often wanting altogether, and covered when young with a deciduous hairy skin. They have no cutting teeth in upper jaw. There are a considerable number of species known, almost all peculiar to Europe, America, and Asia. The best arrangement of the various genera of which the tribe is composed is that according to their geographical distribution. I. *Deer of the snowy regions.* These have a very broad muzzle, entirely covered with hair. The horns are expanded and palmate, and the fawns are not spotted. II. *Deer of the temperate or warm regions.* These have a tapering muzzle ending in a bald muffle. The fawns and sometimes the adults are spotted. To the first section belong the elk and the reindeer. The elk, or moose deer, *Alces malchis*, is the largest species of all the deer, being higher at the shoulders than the horse, and is remarkable for its large expanded palmated horns, which sometimes weigh near fifty lbs. It inhabits the large forests of the northern regions of Europe and America, and though its form is less elegant than the rest of the deer tribe, yet when seen in all the glory of its full grown horns, and amid the scenery of its native wild haunts, no animal can appear more majestic or imposing. The flesh of the elk is stated to be excellent whether fresh or smoked, and the young are said to be particularly delicious. The tongue and nose are considered great delicacies both in Scandinavia and America. The chase of this animal forms an important occupation among the natives of North America, and the skin is used by the Indians for various purposes, especially for making mocassins, and other articles of winter clothing. In Sweden also the skin is converted to many useful purposes; and it is stated that not very long since a regiment was clothed with waistcoats made of the hides, which were so thick that a ball could scarcely penetrate them. The elk is easily domesticated, and attempts have been made to make them draw sledges and perform various agricultural duties.—The reindeer or caribou, *Tarandus rangifer*, is a native of the arctic circle, in Europe, Asia, and America. It is about the size of our stag, and has the horns elongate, subcylindrical, with the basal branches and tip dilated and palmated. To the natives of North America, the reindeer is only known as a beast of chase; but it is a most important one, as there is hardly any part of the animal which is not made available for some useful purpose. The venison forms excellent food, and clothing made of the skin is capable of resisting extreme cold. In the north of Europe it is of far more importance. There it is domesticated, and its services to the inhabitants are invaluable. Possessing the reindeer, the Laplanders want neither horse, nor sheep, nor oxen. Seated in his sledge, which is made light, and to which this useful animal is yoked by a collar, the Laplander travels over the country buried in snow, and will perform a journey of thirty, forty, or fifty miles a-day. Of its milk they make their cheese, its flesh supplies them with food, and their skins furnish them not only with clothing, but with their tents and bedding. A larger variety occurs in Siberia, and the Tungusians use them for riding as well as draught. The chief food of the reindeer is a species of lichen which covers large tracts of the northern regions, and is well known as the reindeer moss, though at times they eat other lichens as well.—To the second section, or deer of temperate and warm regions, belong all the other known species. The wapiti deer, *Cervus Canadensis*, is one of the largest of this section, measuring four and a-half feet at the shoulders. The colour of the hair is red-brown, the tail is very short, and the horns are round and erect, branching in serpentine curves, measuring six feet from tip to tip, and weighing about thirty lbs. It is a native of North America, but not extending farther north than the 56th or 57th degree of north latitude. It still exists on the upper branches of the Susquehanah River, and thence westward may occasionally be found in all favourable situations as far as to the Pacific Ocean. They live in small families of six or seven individuals, inhabiting clumps of wood, and feeding upon grass and the young shoots of willow and poplar trees, the hips of the wild rose, &c. The wapiti is described as a stupid animal, and has a peculiar voice not unlike the braying

of an ass. The flesh is coarse and not much prized by the natives; but the hide, when made into leather in the Indian fashion, is said not to turn hard in drying after being wet, and therefore justly to excel that made from the moose or reindeer. A smaller variety occurs abundantly in California and the upper parts of the Missouri, living in large herds. The stag or red deer, *Cervus Elaphus*, is a noble animal, and a native of the forests of the whole of Europe and Asia where the climate is temperate. The colour is brown, the tail of moderate length, and the horns are round with branches on their inner side, which increase with age, and when full grown will often weigh twenty-four lbs. The red deer is an ancient denizen of the forests of this country, and is intimately blended with the old oppressive forest laws, and with some of our legends of deadly feud, such as "Chevy Chace," &c. In winter they unite in vast herds of both sexes. In England the red deer is now almost unknown in a wild state, but in the Highlands of Scotland they still exist in considerable numbers. The venison is coarser than that of the fallow deer, which has in consequence usurped their place in the walled parks of the noblemen and gentlemen of this country. A variety of the stag, and another species called the Barbary deer, *Cervus Barbarus*, which is smaller than the stag, but of a stouter form, and inhabits the coast of Barbary and the Regency of Tunis, are the only species of the family that are found native in Africa. The bara singa, *Cervus Wallichii*, is a native of Persia, found in all the wooded mountain districts of that country, and is frequently mentioned in Persian literature under the name of *Marāl*, or *Gevezu*. A closely allied species, called also bara singa by the Hindoos, is a native of Thibet, and appears to be confined to the vast primitive forests in the plains. The fallow deer, *Dama vulgaris*,

Dama vulgaris—Fallow Deer.

resembles very much the stag or red deer, but is smaller and of a more gentle disposition. The horns are broad and palmated at their extremities, pointing a little forwards, and branched on their hinder sides. It is generally of a brownish-bay colour, more or less beautifully spotted, and has a tolerably long tail. Originally a native of Persia, it was brought to Europe, where it is now found in most parts in a domesticated state. In England there are two kinds, a beautiful dappled variety supposed to have been brought from the south of Europe or the western parts of Asia, and a deep brown kind which was brought from Norway by James I. The venison of the fallow deer is rich and delicate, and the skin is unrivalled for durability and softness. The horns both of the fallow deer and the stag are manufactured into handles for knives, &c., and from the refuse, ammonia popularly known as *hartshorn* is extracted. The fallow deer is represented in sculpture from Nineveh. Several species of deer, differing from those mentioned above, in having the muffle very high and not separate from the edge of the lips, are found inhabiting south-eastern Asia and its islands. These are described as the *Rusine deer*, and the young fawns of the typical species are marked with much paler spots than the others. The samboo, *Rusa Aristotelis*, inhabits the great forests of India and the mountains above them. They are not gregarious, have a *long bluff tail like a docked horse*, and a heavy mane over the whole neck. The horns are simply forked at the tip, are not complete in form until the fourth year, and do not acquire their full size till the eighth. The axis or chittra, *Axis maculata*, is an elegant species, about the size of the fallow deer, and of a rich fawn colour spotted with white. It is a native of the continent of India and the large islands of the Indian Archipelago, haunting the thick jungles in the vicinity of water. It feeds in the night, and is timid, indolent, and mild, and easily domesticated. The axis is gregarious, the herds being often very large. The muntjac, *Cervulus vaginalis*, is about two feet two inches high at the shoulders, the horns are placed on elongated pedicels, and the antlers are trifurcated. It is an inhabitant of the islands of Sumatra and Java, choosing for its retreat moderately elevated grounds covered with long grass, where shrubs and trees of moderate size grow in small thickets. The flesh affords an excellent venison, but the natives only eat the males. All the species above mentioned belonging to the deer of the temperate regions have their horns furnished with a basal snag or short branch; but there are a number which have horns destitute of a basal snag. These are called capreoline deer; all, with two exceptions, natives of America. The roebuck, *Capreolus capræa*, is one of these, and inhabits Europe, being found frequently in France, Italy, Sweden, Norway, and Siberia. At one period the roebuck was common in various parts of Great Britain, but is now very seldom seen except in the northern parts of Scotland. It is about two feet three inches in height at the shoulders, and in winter is covered with long hairs tipped with gray; but in summer the coat

is short and smooth and of a bright reddish colour. They congregate in small families and not in herds, frequenting the lower coverts and less wild woods, and feeding upon herbage and tender shoots of underwood. The flesh is delicate food when well killed, and the horns are used for making knife handles, &c. The genera *Blastoceros*, or *mazame*, and *Furcifer*, are confined to South America. The male of the former is described as having an overpowering, strong, and offensive odour, and when a large herd is passing, the whole air is said to be tainted with the effluvium. The *Cariacus*, as a genus, is confined to northern America; several species are described, some from Hudson's Bay and the Colombia River, others from California and Mexico. The American deer, *Cariacus virginianus*, is about the size of our fallow deer, with slender cylindrical antlers bending much forwards, of a bright yellow or buff colour in summer, and of a reddish-gray in winter. They are found inhabiting all the timbered or partially timbered country between the coast of the Atlantic and Pacific Oceans. They are very restless but not fierce, and when alarmed erect their tails, which being white beneath is a conspicuous object, when they run wagging it from side to side. Their skins are a great article of commerce. The *Coassus* has the horns simple, not branched, and very short. The species are generally small, are all natives of South America, and emit a strong smell like that of porcupines.—Fossil remains of various recent deer have been found in the shell marl in several parts of Scotland; and a considerable number of extinct species have been discovered in the Bone Caverns and the tertiary deposits which contain bones of the mastodon, rhinoceros, and dinotherium. One of the most particular of these fossil deer is the great Irish elk, *Megaceros Hibernicus*, found in different parts of Great Britain, but more

Megaceros Hibernicus.

abundantly in Ireland. This large deer exceeded the largest wapiti or elk in size, and greatly surpassed them in the size of its antlers. These measure about five feet two inches each in length, and the breadth of the most expanded part one foot ten inches. The limbs and the vertebræ of the neck are proportionately strong, though little, if at all, exceeding those of the elk in length. The weight of the skull alone without the lower jaw is about five and a quarter lbs., while with the antlers and lower jaw united, the weight is from seventy-six to eighty-seven lbs.! About fifty fossil species of deer have been described, found in various parts of the world.

Cervulus.—See CERVINA.

Cervus.—See CERVINA.

Cestoidea (κεστος, a band).—An order of intestinal worms. See ENTOZOA.

Cestracion.—A genus of chondropterygious

fishes belonging to the family *Squalidæ*, or sharks. They are natives of New Holland.

Cestrum. *Bastard Jasmine.*—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, containing about sixty species of small shrubs, all natives of tropical America and the West Indies. The greater number of them are interesting from the beauty of their general appearance and the perfume of their flowers. Some, as *S. nocturnum*, a shrub from six to nine feet high, and a native of Cuba, exhale a sweet odour during the night only; while others, as *S. diurnum*, a slender shrub from ten to twelve feet high, and a native of Chili and the West Indies, give out their odour only during the day. These two species are cultivated in this country, and the one is called the "lady of the night," and the other the "lady of the day." *S. auriculatum*, a shrub about fifteen feet high and a native of Peru, exhales during the night a musky odour, while during the day it gives out a smell disagreeable and almost fetid. Like the rest of the family to which they belong some of the species possess narcotic qualities. *S. venenatum*, a large shrub, a native of the Cape of Good Hope, and which emits a perfume like that of the jasmine, is highly poisonous. A decoction of the bark, evaporated to the consistence of an extract, is used by the Hottentots to poison their arrows, and to kill wild beasts by mixing with their food.

Cestum.—A genus of animals belonging to the class *Acalephæ*.

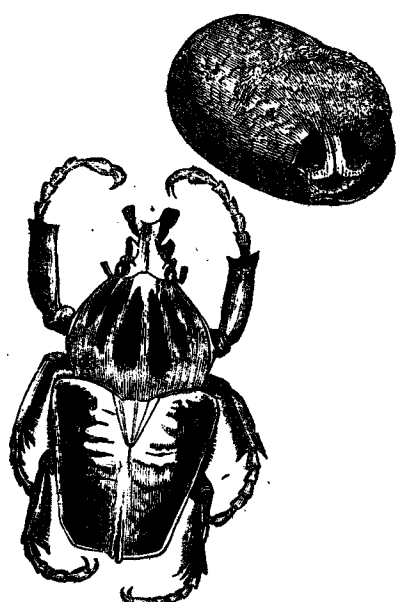
Cetacea, or **Cete.** *The Whale family.*—An order of animals belonging to the class *Mammalia*. The whales are aquatic in their habits, with their anterior extremities shaped like fins, and the posterior united so as to form a horizontal tail. Their body is fish shaped and bald, and their teeth are simply conical and rootless. They are viviparous, suckle their young, have warm blood, and respire through lungs. This order comprises the largest animated forms in existence. See BALÆNIDÆ, CATODONTIDÆ, DELPHINIDÆ, and MANATIDÆ.

Cetiosaurus (*κητος*, a whale; *σαυρος*, a lizard).—A genus of gigantic fossil reptiles, four species of which have been described from the oolitic formations of England. The vertebræ and the bones of the members are spongy in structure, and the latter present no trace of a medullary cavity. They were most probably marine animals, and from the size of the remains which have been found must have been of very great size.

Cetochilus.—A genus of entomostracous crustacea. See CYCLOPIDÆ.

Cetonia. *The Rose Chafer.*—See CETONIIDÆ.

Cetonidæ.—A family of coleopterous insects belonging to the *Lamellicornes*, containing ten genera which have been separated from the old genus *Cetonia*. The species are remarkable for their complicated respiratory apparatus, consisting of an innumerable quantity of tracheæ, which envelop all the muscles from the head to the extremity of the abdomen. The genus *Cetonia*, or rose chafer, contains about 200 species, which are mostly of a heavy and ungraceful form, but of a splendid brilliancy of colour. They have a very rapid flight, making a noise as they fly, and are generally found on roses, the privet, or corymbiferous flowers, sucking the honey like bees. The common rose chafer, *Cetonia aurata*, is the best known species, and is frequently to be seen on the rose trees of our gardens, its fine emerald-green colour contrasting agreeably with the delicate tints of the petals of the queen of flowers. The larvæ are generally found amongst the decayed portions of wood, &c., at the foot of trees, but they are also occasionally found in ants' nests. Here the creatures live harmoniously, and it would appear that they are attracted there by the warmth of the situation. At the approach of winter they penetrate two or three feet into the ground, but do not acquire their full size till about three years have elapsed. They then form a cocoon, made solidly, of chips of wood and other materials around them, which they glue together by means of a gummy liquid which they themselves secrete. In the summer



Goliathus Drurii—Goliath Beetle and Cocoon.

they come forth in the perfect form. A very pretty species, *Agestrata luconica*, is found in the Philippine Islands, of a fine brilliant metallic

green. The ladies of Manilla keep them as pets, in small bamboo cages, which they carry about with them. The beetles of this family are widely dispersed, but they more especially frequent tropical climates. They vary much in size and markings. The *Incæ* are Brazilian species, reposing during the morning in the plantations of maize, sitting under the leaves, and fly during the day round the lofty trees, upon the leaves of which they feed. They are styled the princes of the beetle tribe, but are inferior in size to the goliaths (*Goliathus*) which are peculiar to tropical Africa. *Goliathus cacicus* is a very fine large beetle, and is said to be roasted and eaten by the natives. Several species of this genus used to be very rare amongst collectors, and high prices, as much as from £30 to £50, were at one time given for a single specimen. Our figure represents *G. Drurii*, the largest of all, with its cocoon and young beetle inside. The larvæ form a cocoon of mud in which they pass their chrysalis state.

Cetraria. *The Iceland Moss.*—See THALLOGENÆ.

Chabazite. *Cubic Zeolite.*—A mineral consisting of silica, alumina, and lime, occurring in the form of attached rhomboid crystals, of a white, yellow, or red colour, and of a vitreous lustre. It is found in trap rocks in Scotland, Ireland, the Faroë Islands, and Iceland.

Chætodontidæ (χαίτη, a mane; ὀδους, a tooth).—A family of acanthopterygious fishes, having a short, broad, much compressed body, and their fins thickly covered with minute scales. They have a small mouth, and numerous small teeth resembling bristles, from whence their name. These fishes are very numerous on the rocky shores of the seas of warm climates, are generally beautifully and variously coloured, and are esteemed good eating. They have a large air-bladder. The species of *Chætodon* have their opercular bones finely ciliated. *Chætodon vagabundus*, inhabiting the coasts of Ceylon, is beautifully marked with oblique brownish-purple lines and black bands, while the body is of a pale yellow colour. The *Chelmons* are remarkable for the length of their snout, with their mouth small, placed at the extremity, and teeth like fine hairs. *Chelmon rostratus*, an inhabitant of the shores of Asia, possesses the faculty of shooting insects with drops of water projected from the mouth, and seizing them as they fall. Several species of this family have been found fossil in Mount Bolca in Italy.

Chætophoraceæ.—A family of confervoid algæ, growing in sea or fresh water, and invested with gelatinous matter. It contains at least six genera, of which the genus *Chætophora* may be taken as the type. The species are found in fresh water, forming little protuberances on stones, sticks, &c., usually of a bright green colour, and consisting of setigerous branched filaments imbedded in a gelatinous matrix. Six species are natives of Britain. The other genera are *Draparnaldia*, *Bulbochæte*, *Coleochæte*, *Ochlochæte*, and *Aphanochæte*.

Chalcidæ (χαλκος, brass; ειδος, form).—A family of reptiles belonging to the order *Saura* or lizards. The body is elongate and cylindrical, the back and tail covered with four or six-sided scales, and the legs, of which there are four, are very short, and even rudimentary. They are found in India and America.

Chalcididæ.—A family of insects belonging to the order *Hymenoptera*. The species are generally of a very small size, but are almost all adorned with brilliant, varied, metallic colours. They are immensely numerous, and are divided into many groups. The perfect insects live on flowers and plants in general. The female deposits her eggs in the bodies of the caterpillars or larvæ of other insects, where they are hatched after a short time. At first these parasitic larvæ only eat the fatty matters of their hosts, and abstain from touching the vital parts. They undergo their metamorphoses in the same situations. Sometimes the eggs are deposited in the bodies of pupæ, and at others even in the substance of the eggs of other insects; and it is a curious fact, that generally each species of chalcididæ chooses a particular species of insect for its victim. These insects are extremely valuable to the agriculturist, as they contribute to keep down other insects which are injurious to growing crops. Ten species have been described which confine their attacks to the larvæ of the *Pyralis* of the vine, the ravages of which are so terrible at times. Some lay their eggs in galls, and the progeny attack the larvæ enclosed within. About 1,200 different species have been described, inhabiting Great Britain alone. Those of the typical genus *Chalcis* are the largest of the family.

Chalcosoma.—A genus of beetles. See DYNASTIDÆ.

Chalk.—The earthy form of carbonate of lime. It contains flints, and abundance of the remains of marine animals and plants, showing that it has not had its origin in chemical precipitation. Many species of birds, reptiles, shells of mollusca and echinodermata, and the polypidoms of zoophytes have been found. In addition to these, immense numbers of the shells of foraminifera, valves of diatomaceæ, and spiculæ of sponges are detected by the microscope. A small portion of scraped chalk, diffused in water, and properly treated with turpentine and Canada balsam, seldom fails to show that the mass is chiefly composed of minute, well preserved organisms, of which the foraminiferâ are the most abundant.

Chalybæus.—A genus of birds belonging to the conirostral tribe of the order *Passeres*, and synonymous with *Phonygama* of Lesson. These birds are natives of New Guinea, and are remarkable for the metallic tints of their plumage.

The typical species, *C. paradiseus*, the blue-green bird of paradise, lives solitary in the forests of that country, and feeds upon fruits. The plumage is of a bluish metallic green and richly coloured. The natives of New Guinea sell it as a bird of paradise.

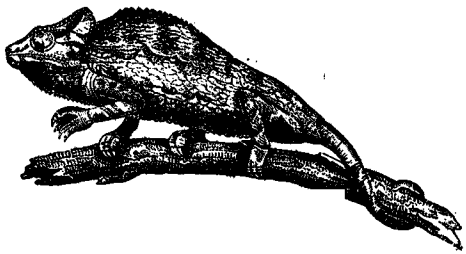
Chama.—A genus of shells. See CHAMIDÆ.

Chamædorea (χαμαι, upon the ground, humble; δορυ, a twig).—A genus of plants belonging to the palms, natives of South America. They are slender reed-like plants about five or six feet high, and approaching in their growth herbaceous plants or bamboos. The species are elegant little palms, and some of them are cultivated in our gardens. *C. fragrans*, the chutassium of the Peruvians, of whose country it is a native, is very fragrant, filling the groves with its sweet odour in the months of August, September, and October.

Chamærops (χαμαι, upon the ground; ῥωψ, brambles).—A genus of plants belonging to the palms, generally of humble growth, some of the species scarcely rising above the ground. They are characterized by having fan-shaped leaves. The palmetto, or dwarf fan-leaved palm, *C. humilis*, is remarkable for being the most northern species of all the family. It is a native of the shores of the Mediterranean, and is abundant in the warmer portions of that region. On the European side it is very small, without any apparent stem, and in Spain covers the ground much in the same manner as fern does in the more northern parts. In Algeria, however, this plant rises to the height of several feet, the trunk being five or six inches in diameter, and closely covered with triangular hard scales, which are the bases of the old leaves. The leaves spring immediately from the head of the stem, to the number of from thirty to forty, each from nine to eighteen inches long, nearly a foot broad, and spread open like a fan. These leaves are tied up into besoms for sweeping, and are also used for making baskets and thatching buildings. The young underground parts of the stem and the young roots are sweetish and tender, and are said to be eatable.

Chameleo (χαμαι, on the ground, humble; λεω, a lion).—See CHAMELEONIDÆ.

Chameleonidæ.—A family of reptiles belonging to the order *Saura*, or lizards. The only genus this family contains is the *Chameleo*, the species of which inhabit Africa and Asia, and some are naturalized in southern Europe. The common chameleon, *Chameleo vulgaris*, is the best known species, and is a native of India, Asia Minor, Egypt, North Africa, and Spain. The physiognomy of this animal is very singular. A large head armed with horn-like appendages, and bony crests on the nape of the neck, a huge mouth, and eyes of a large size, and possessing the peculiar faculty of moving each independently of the other, so that it can "look two ways at once," give it a peculiar appearance. Its compressed body, arched back,



Chameleo vulgaris—The Chameleon.

long prehensile slender tail, by which it can seize firm hold of neighbouring objects, and its feet, the toes of which are all armed with a sharp claw, and arranged in two grasping opposable groups, distinguish it from all other reptiles. The tongue of the chameleon is very long, when fully extended, nearly as long as the body, and its movements are excessively rapid. It is cylindrical, terminated by a dilated and somewhat tubular tip covered with a glutinous secretion. By a curious mechanism, of which the os hyoides or tongue bone is a principal agent, this organ can be protruded to the length of six inches and withdrawn again with amazing celerity. The chief food of the chameleons consists of living insects; and it is by means of this extensile organ that they are enabled to catch their prey, which they do by darting it forth with unerring precision. The power of changing colour possessed by the chameleon is another curious part of the animal's history. It has been exaggerated considerably by the early writers and by moralists, who employ this attribute to designate men who are dangerous and deceitful. Its ordinary colour is a gray or a pale yellow, a good deal resembling that of the trees upon which it lives, but it is able to assume a variety of colours according to circumstances. Many theories have been proposed to account for this phenomenon; but the fact is that in the skin there exist two layers of pigment of different colours, placed one above the other, the deeper of which occasionally appears to a greater or less degree in the midst of the superficial layer and then disappears beneath it again, and it is the displacement of this layer that is the true cause of this phenomenon. Eighteen species of chameleons are described, most of them natives of Africa and Madagascar. They are essentially climbers, living on trees and supporting themselves there by their feet and prehensile tail. Their movements are slow, regular, and grave. They are oviparous, and their eggs are numerous and enveloped in a tough parchment-like skin. The lungs, which are large,

are connected with air cells that lie among the muscles and beneath the skin, giving them the power of distending their body at pleasure.

Chamidæ.—A family of molluscous animals belonging to the class *Conchifera*, and order *Goniopoda* or *Siphonida*. This family contains a variety of shells which fix themselves to rocks, &c., in the manner of oysters, and includes several genera. The genus *Chama* is the type, and the species are generally thick, solid shells, adhering by their under valve to stones, corals, rocks, &c.; they are found in the seas of hot climates, often in large groups, and at considerable depths. Their method of attachment to other bodies modifies their form and frequently gives them a distorted appearance.

Chamostrea (*Chama*, a genus of shells; and *ostrea*, the oyster).—A genus of conchiferous or bivalve mollusca belonging to the family *Anatinidæ*, and remarkable for the mechanism of the hinge. The shell is very like that of the chama, and is attached to rocks by the anterior side of its right valve. The cartilage connecting the two valves is internal, and has an elongated curved testaceous appendage inserted into a deep scar in each umbo. Only one species, *C. albida*, is as yet known; it is found in New South Wales. The name is derived from its resemblance to a chama and an oyster shell, with neither of which, however, has it any relations. It has also been called *Cleidothærus*, from the resemblance the ossicle attached to the cartilage bears to a clavicle.

Chara.—A genus of plants. See THALLOGENÆ and CHARACEÆ.

Characeæ.—A family of plants, the situation of which in the natural system has been much disputed. In the Linnæan method they have been placed by some in the class and order *Monandria Monogynia*, and by others in *Monœcia Monandria*. In the natural method, some assign them a place amongst the *Naiadaceæ*, or pond weed family, others amongst the *Algæ*, and a third set of botanists between the *Hepaticæ* and *Algæ*. Their fructification is curious. From the centre of the antheridium or *globule*, as it is called, which is composed of cells, a number of long septate tubes or filaments arise. Each of these tubes is composed when mature of a larger number of small cells, and in every one of these cellules there is contained a filament which ultimately escapes in a spiral form. When placed in water, this body, which is called a *phytozoon* or *spermatozoon*, exhibits two vibratile cilia and swims actively about in the fluid.

Charadriidæ.—A family of birds belonging to the order *Grallæ*, and containing the plovers, thick-knees, &c. These birds have their feet formed for running, three-toed, the outer toes connected at their base by membranes, and the tail rounded or wedge-shaped. Their bill at the base is flexible, and the end hard and horny. They are divided into several groups or subfamilies. The *Œdicneminæ*, or thick-knees, have the bill about the length of the head, depressed at the base, compressed and vaulted at the tip, and their legs lengthened, swollen about the knees, and furnished with three short toes. They are found in the uncultivated open country and dry deserts, searching for worms, slugs, insects, and small reptiles. The great plover, or stone curlew, *Œdicnemus crepitans*, is found throughout the most of Europe, in Asia and Africa, and, though not very common, in various parts of England. It is rapid on foot, powerful in flight, haunts downs and open places, and its shrill cry may be heard a mile off in a still evening. Slugs, worms, and reptiles form its food. It is larger than the woodcock, and its flesh when young is said to be delicious. The coursers, *Cursorinæ*, have moderate sized bills, depressed at the base, and towards the tip curved and pointed. Their legs are lengthened and scutulate, and their toes, three or four, armed with small claws. They live on sandy deserts in Africa and Asia, where they feed on worms and insects, &c., and run with surprising speed, if disturbed. The genus *Cursorius* is the type of the sub-family. The true plovers, *Charadrinæ*, have their moderate sized bill swollen and arched at the tip, and the nasal orifice extending along two-thirds of its length. Their legs are long and slender, naked above the knee, and most of the species want the hind toe. They are found in Europe and other parts of the world, living gregarious in meadows or on the sea shore, where they may be seen in search of food, stirring up the mud or earth by their feet, and thus attracting worms and aquatic insects to the surface. The ringed plover, *Charadrius hiaticula*, is common on the sea coasts of Britain during summer, running along the sands and making a loud twittering noise. The golden plover, *C. pluvialis*, is common in this country, and all the northern parts of Europe, breeding on high and heathy mountains, but about the end of August descending to the fallows and newly-sown wheat fields, where they are able to obtain abundance of food. At that season, they soon become fat, and are excellent for the table, their flesh being equal in flavour to that of the woodcock. Their usual note is a plaintive monotonous whistle, by imitating which they may be enticed within gun shot. The lapwing or peewit, *Vanellus cristatus*, is an elegant bird, and has the occipital feathers long, loose, barbed, and curved upwards in the form of a crest. It is spread over all Europe, and is particularly abundant in Holland. The lapwings are found in this country in large flocks, and in the month of October they are reckoned excellent eating. Their eggs, which are considered great delicacies, are in much request at the tables of the luxurious, and are called "plover's eggs." The stratagems which these birds, as well as the golden plover, use for leading either dog or man from their young, tumbling over as if unable to fly, feigning

lameness, &c., are well known. The dotterel, *Eudromias Morinella*, is a native of the northern parts of Asia and Europe, and is a migratory bird, making its appearance in this country in spring. This bird is said to be very stupid, but it is a nocturnal feeder like many others of the family, and coming direct from its native wilds, where it is perfectly unmolested by man, it shows at first little or no fear, and may easily be taken. Their flesh is considered good eating. The turnstones, *Cinclinæ*, have a short bill, thick at the base, narrowing gradually to the point, the nasal groove reaching half its length. The tarsi are rather short, with four toes. The common turnstone, *Cinclus interpres*, is a bird which has a wide range, inhabiting the northern parts of Europe and America, the United States, Straits of Magellan, Cape of Good Hope, Japan, Sunda, the Moluccas, New Guinea, and Australia. In this country it is found on the coasts from August to May, returning northwards after that to breed. The turnstone feeds upon small molluscous animals and crustacea, turning over with its strong bill the stones under which their prey take shelter. The oyster catchers, *Hæmatopodinæ*, have a strong bill, longer than the head, broad at the base, compressed, with the tips truncated, and legs of moderate length, scutulated, and with three toes united at the base by a membrane. They seek their food on the sea shore; it consists of shellfish which they are enabled to wrench out by inserting their bill between the valves, also of other marine productions. They both run and fly with great rapidity, and have a shrill resounding cry. The oyster catcher or sea pie, *Hæmatopus ostralegus*, is common in the north of Europe, from Denmark, Sweden, and Norway, to Russia, Siberia, and Kamtschatka. It breeds in the British Islands, from the Scilly Isles to Shetland, and is easily domesticated in poultry yards.

Charadrinæ. *The True Plovers.* — See CHARADRIIDÆ.

Charadrius. *The Plover.* — See CHARADRIIDÆ.

Charæas.—A genus of nocturnal *Lepidoptera*, the larvæ of some of which are injurious to pastures. *C. graminis*, or antler moth, is common in Sweden, where its larva, as it feeds on grasses, is at times very destructive to the pastures of that country.

Chartergus (*χαρτης*, paper; *ἐργον*, work).—A genus of hymenopterous insects belonging to the family *Vespidæ*, containing several species of wasps, which construct their nests of a substance like paper. *C. nidulosus* is the type of the genus, and is found in Guiana. Its nest is large, in form of a truncated cone, and is suspended by a ring from the topmost branches of the trees so as to swing backwards and forwards with the wind, and be out of the reach of the monkeys. The structure of the nest is so like card-board, that experienced workmen could not tell but what it came from a paper manufactory. The Licheguana wasp is another species, *C. (Polistes) Licheguana*, the honey from which sometimes produces poisonous effects in those who eat it.

Chaulmoogra.—A genus of plants. See FLACOURTIACEÆ.

Chaus.—A genus of cats. See FELINÆ.

Chavica.—A genus of peppers. See PIPERACEÆ.

Cheilanthites.—Fossil species of ferns found in the coal measures, and resembling in their forms the genus *Cheilanthus*. Twenty-seven species have been referred to this genus.

Cheilanthus (*χειλος*, a lip; *ἀνθος*, a flower).—A genus of ferns nearly allied to *Adiantum*. The species are elegant plants, often remarkable for the number and small size of their pinnules, and sometimes clothed with a fine down. About thirty species are described.

Cheiracanthus (*χειρ*, hand; *ακανθα*, spine).—A genus of fossil fishes from the old red sandstone of Gamrie in Forfarshire.

Cheiranthus (*χειρ*, hand; *ἀνθος*, flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and containing several species remarkable for their sweet scent. The common wallflower, *C. cheiri*, has long been cultivated, is well known, and universally esteemed for the beauty, durability, and fragrance of its flowers. It is found wild throughout Europe on old walls and in stony places, and chiefly

"Decks the rough castle's rifted tower."

"It is a suggestive flower, and marks the era of the decline and fall of the rough feudal times." A number of varieties occur in our gardens, eleven or twelve of which are quite distinct. The stock gillyflower, *C. incanus*, and the annual, or ten weeks' stock, *C. annuus*, are also well known, and much cultivated for the beauty and sweetness of their flowers. They are natives of the sea coasts of the south of Europe, but have been long introduced into our gardens, where several varieties are known. The Mediterranean, or as it is improperly called, Virginian stock, *C. maritimus*, is a native of the coast of the Mediterranean, and though of humble growth, is much cultivated as an edging to borders, or in patches along with other annuals, on the beds of our gardens, which it enlivens with the splendour of its blossoms. The flowers are of a bright lilac, but are scentless.

Cheirogaleus (*χειρ*, hand; *γαλη*, a cat).—A genus of quadrumanous animals belonging to the family *Lemuridæ*. Five species are known, all natives of Madagascar. They resemble other lemurs, but have a long bushy tail; are nocturnal animals, sleeping during the day, rolled up in form of a ball, but as soon as night comes on, becoming lively and active, and showing great agility. They live on fruits.

Cheirolepis (*χειρ*, hand; *λεπος*, a scale).—A

genus of fossil fish from the old red sandstone of the Orkney Islands and Morayshire. The scales are very minute.

Cheiromys (χειρ, hand; μυς, a rat).—A genus of quadrumanous animals belonging to the family *Lemuridæ*; though formerly arranged by Cuvier amongst the *Rodentia*. The aye aye, *C. Madagascariensis*, is the only species yet known. It has a large round head, slender ears, but widely open, and a long tail with a tuft at the extremity. It has no canine teeth, but possesses in both jaws a pair of strong incisors, separated by an open space from the molars. It is a native of Madagascar, about the size of a hare, and has long fingers on the anterior extremity, the middle one being especially slender. The food of this animal consists of the larvæ of insects, and these long fingers are peculiarly well adapted for rummaging under the bark of trees, and conveying their food to the mouth, its slender middle finger pushing it down even into the throat. Its first discoverers conveyed it from one part of the island to another, the inhabitants of which had never seen it; in their surprise they exclaimed aye! aye! and hence its English name.

Cheiroptera (χειρ, hand; πτερον, a wing). *The Bat family*—VESPERTILIONIDÆ.—A family of animals belonging to the class *Mammalia*, and order *Primates*. The animals of this family have their fore arm converted as it were into a wing by an extension of the membranous skin, which, rising from the sides of the neck is spread between their fore feet and their fingers. In consequence they are able to raise themselves from the ground and fly in the manner of birds. Great errors formerly prevailed with regard to the history of bats, and superstitious notions were long felt towards them. Their nocturnal habits, and the choice of their gloomy places of abode, inspired whole nations with a dislike to them. Moses placed them among the unclean animals the Jews were forbidden to eat. The Greeks took them as the models of their disgusting harpies. In the middle ages they were made the companions of sorcerers and evil-disposed men; and when they wished to represent Satan they placed a pair of bat's wings on his shoulders! The early naturalists, from Aristotle to Aldrovandus and Scaliger, placed them amongst the birds, whilst now they are placed in the same order of mammalia as man himself. The bats are all nocturnal animals, retiring during the day to dark caves, ruins, holes in the trunks of old trees, &c., where they remain motionless, hanging suspended by their hinder feet, the claws of which are particularly well adapted for the purpose. Sometimes they cling to each other and form enormous masses, especially in subterranean caverns. The anterior extremity having in these animals passed into the form of a wing, they become in consequence unable, properly speaking, to walk. When placed on a flat surface, their progression is more of a zigzag shuffle than a straight walk, and though they can thus move with considerable celerity, it is in a most ridiculously grotesque manner. Their food consists of insects; only one genus forming an exception, and it lives on fruits. Their wings appear to be remarkably sensitive to external impressions. As an organ of touch they are exceedingly delicate and acute. Experiments, cruel ones, have been made to test this power. The poor animals have been deprived of their eyes, and with a piece of leather bound over the sockets let loose to fly in rooms and passages. Notwithstanding their deprivation, it was found they avoided all obstacles placed in their way as readily and with as much ease as if they still retained their organs of sight. Bats are widely distributed over the globe, and are found both in the Old and New Worlds, and in Australia. They form two large groups; the species belonging to one having a membrane in form of a leaf upon the nose, in which the nostrils are placed, are called leaf-nosed bats; and the others being destitute of it, are called leafless-nosed bats. To the *leaf-nosed bats* belong the phyllostomes and vampyres. The species of *Phyllostoma* are natives of South America, where, like all the bats there found, they are considered by the Brazilians to bite the skin and suck the blood both of men and animals. Wild notions were at one time entertained with regard to this faculty, and many apparently well authenticated instances of their sucking the blood of men to a great extent, have been related. They were said only to attack their victims when asleep, and to fan them with their large wings during the operation. Most of the stories told by early writers appear to be much exaggerated, but still modern travellers confirm the fact that several species are decided blood suckers, though it is chiefly cattle that they fasten upon. The javelin bat, *Phyllostoma hastatum*, is a native of Eastern Brazil, where it may be seen flying at some height, and strongly though not quickly in the evening; and is one of the species particularly mentioned as being in the habit of sucking the blood of beasts of burthen, and weakening them much from loss of blood. *Desmodus d'Orbignyi*, a native of Chili, has been detected by a late traveller, Mr. Darwin, in the same occupation, and the spot where the horse was bitten was next day swollen and bloody. The spectre bat, *Vampyrus spectrum*, has been generally considered by zoological writers as a species also much addicted to blood sucking. This animal is as large as a pigeon, and measures twenty inches in the expansion of its wings. It is a native of South America and the West Indies, and it is to this species that most of the wonderful stories told upon the subject of vampyres refer; though it would appear they more properly apply to the species mentioned above. The horse-shoe bats, *Rhinolophus*, are also leaf-nosed bats, and are natives of the Old World only. They have large ears, a

greatly developed nose, and some have rather long tails. They live upon insects, and during the day inhabit deep caverns and holes, from which they sally forth at night in quest of food. See RHINOLOPHUS. Two species are natives of Great Britain, the larger and the smaller horse-shoe bat. The *leafless-nosed species* are the most numerous; their nostrils are simply pierced in the end of the muzzle, without any nasal disc. The species of the genus *Nycteris* are distinguished from the others by the ease and elegance of their flight, and by the power they possess of inflating their skin with air so as to render their bodies light. They are natives of Africa. The eared bats, *Plecotus*, have the ears much developed, being larger than the head. The common long-eared bat, *Plecotus auritus*, is a native of Great Britain, and is the smallest of the bat kind, measuring about an inch and three-quarters in length, and seven in expansion of wings. It is commonly found in old towers, where it lives alone, and is one of the most common bats of this country. Its cry is generally feeble, but when disturbed becomes distinct and shrill. The barbastelle, *Barbastellus communis*, is occasionally found in England, inhabiting houses, and is remarkable for its very fetid smell. The species of *Vespertilio*, or true bat, have thin ears and wings, while those of *Scotophilus* have them thick. Of these two genera and a closely allied one, *Myotis*, at least twelve species are natives of England. Generally throughout the day they remain hidden in hollow trees, clefts of rocks, eaves of houses, &c., but as soon as the sun sinks below the horizon and twilight appears, their busy time arrives, and they are seen darting and swimming around trees, or flitting over streams where gnats and other crepuscular insects are swarming, and, as it were, inviting their voracity, till morning dawns, when they speedily fly off to their retreats. The pipistrelle or common bat, *Scotophilus murinus*, is the most common bat in England, and is more active than the other species. Its flight is quick and flitting, whence it is commonly called *flitter mouse*. Some of the species of *Taphozous* live in tombs and caverns. One, *T. perforatus*, is found in the Egyptian catacombs, in the tombs of the kings of Thebes, and in the deep caves at Ombos. Some of them show great maternal affection. The *Noctilios* are remarkable for having a cleft in the upper lip, and are called *Hare-lipped bats*. They are natives of South America. The bulldog bats, *Molossus*, are natives of both the Old and New World and have a peculiarly disagreeable physiognomy. Their head is large, with a very broad snout, and their large ears project over their eyes. They live in caverns, are not able to fly well, but climb the trunks of trees and walls with great vigour, and probably feed on insects. The roussettes, *Pteropus*, are numerous, and differ from all the other bats in feeding upon fruits instead of insects. They are all natives of the Old World, are of quiet habits, and live in large flocks, suspended during the daytime to trees, rocks, or old buildings. The kalong, *Pteropus edulis*, is of a considerable size, varying from eleven to fifteen inches in length, and from three to five feet in extent, and is abundant in the island of Java. It lives in society, numerous individuals selecting a large tree for their resort, and suspending themselves often in companies of several hundreds. They pass the greater portion of the day in sleep, hanging motionless, and presenting to the sight of a stranger to their habits the appearance of a peculiar large fruit. Soon after sunset they quit their hold, and direct their course to villages and plantations, where they occasion incalculable mischief to fruit of every kind. They themselves are much esteemed as food, the flesh being white, delicate, and tender, though generally imbued with a smell of musk. Fossil remains of bats have been found in the bone caves of England and the continent of Europe, closely resembling the existing species.

Cheirostemon. *The Hand Tree.*—A genus of plants. See BOMBACEÆ.

Cheirotherium (χειρ, hand; θηριον, animal). —A name proposed by Dr. Kaup for the animals which have left their footprints on the red sandstone of Hildburghausen and of England. It is considered to be the same animal as the LABYRINTHODON, which see.

Chelidonium. *Celandine.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Papavaraceæ*. The larger celandine, *C. majus*, is a native of Great Britain and other parts of Europe, and the whole plant abounds in a yellow or saffron juice, which has a bitterish, acrid taste, and a faint, unpleasant smell. The virtues of the celandine were at one time highly extolled in medicine, and it is still occasionally used in jaundice by the empiric. The juice is said to destroy warts, remove specks from the eyes, and clean foul ulcers. The movement of the elaborated sap or latex, known by the term *cyclosis*, is well seen in the leaves of this plant.

Chelifer.—A genus of animals belonging to the class *Arachnida*, and family *Pseudo-scorpiones*. The species of this genus are small, and resemble in form a minute scorpion without a tail. They are found under stones, the bark of trees, &c., or in houses, amongst old papers, or in holes of walls. They feed on the dead bodies of insects, or on any dried animal substances, and occasionally on wood lice or flies, on which they are parasitic. They run fast, moving backwards, forwards, and often sideways, like crabs.

Chelmon.—A genus of fishes. See CHÆTODONTIDÆ.

Chelodina.—A genus of reptiles. See CHELONIA.

Chelonia (χελωνη, a tortoise). *The Tortoises.* —An order of reptiles belonging to the section *Cataphracta*, or shielded reptiles. The animals of this order have no teeth, their jaws instead

being covered with a horny, more or less powerful bill. Their body is short, discoidal, or swollen, and enclosed in a case formed of two shields, united by their margins, and composed of a series of imbedded plates, which leaves the head, neck, limbs, and tail free. These parts are generally covered with a scaly skin; they have four legs, which are short and thick, and a short, conical tail. Their brain and senses are moderately developed; they respire at all ages by means of lungs, and are oviparous. Upwards of 130 recent species have been described, and the number of fossil species is considerable. The habits of the chelonians differ considerably from each other in the various families into which they are divided. The *Testudinidæ* are terrestrial, and live on vegetables and roots. The *Emydidæ* and *Chelydidæ* inhabit fresh water ponds, and are carnivorous, only eating their food while in the water. The *Trionycidæ* frequent rivers, and though for the most part carnivorous, they sometimes feed on vegetables also. The *Cheloniidæ* are all marine, some of them living on *algæ* and other marine plants, and others on molluscous and radiated animals. The species belonging to the family *Cheloniidæ*, or turtles, destined to live in the bosom of the sea, have their form organized for that purpose. Their feet are formed so as to constitute perfect oars, and thus, though much embarrassed on land, they enjoy great facility of movements in the water. They are generally of considerable size, and live in great numbers in the intertropical seas. They make their appearance also in the temperate zones of both hemispheres, but are never found, except accidentally, in cold climates. The turtles have always been objects of much regard amongst naturalists, travellers, and the inhabitants of the shores where they are found. Their flesh is delicious, and well known to all who love the pleasures of the table. The eggs are abundant, and also form an excellent article of food; and the shell, commonly called tortoise-shell, which is of a horny consistence, is in some of the species so fine, as to be used for ornamental purposes, and forms a considerable article of commerce. The turtles hardly ever leave the sea, except for the object of laying their eggs. The sandy beaches of desert islands are chosen by them for this purpose; and, dragging themselves up above high water-mark, the females hollow out a shallow nest, and deposit at each sitting (three sittings taking place at intervals of two or three weeks) about a hundred eggs. These are lightly covered with loose sand, and left to the fostering influence of a hot sun. The species of the genus *Chelonia* are pure vegetable feeders; and it is this genus that furnishes the best edible turtles. The green turtle, *Chelonia viridis*, or *midas*, is five or six feet long, and weighs from 700 to 800 lbs. It is principally found in the Atlantic Ocean, and is often met with 700 or 800 leagues from the land. They are easily taken when asleep on the surface of the water, to which they come to breathe. In the West Indies, the Bahama Islands, and the Island of Ascension, the capture of turtles gives employment to many people, and affords food to thousands. The hawk's bill turtle, *Caretta imbricata*, is a smaller species, scarcely ever surpassing 200 lbs. weight, and is a native of the Atlantic and Indian Oceans. The flesh is not good, but the shell, which is formed of a considerable number of scales, overlapping each other at their extremities in the manner of tiles on the roof of a building, is of great importance as an article of commerce, and is much superior to that of any other species. It is extensively used in the manufacture of combs, snuff-boxes, &c., and in inlaying and other ornamental work. The best tortoise-shell is that of the Indian Archipelago, and its goodness depends mainly on the thickness and size of the scales, and in a smaller degree on the clearness and brilliancy of the colours. Singapore is the chief mart for tortoise-shell, though a considerable quantity is likewise exported from Canton. The quantity imported into Great Britain, from all places eastward of the Cape of Good Hope, except China, amounted in 1832 to 39,004 lbs., the duty, at 2s. a pound, producing £458 1s. 7d. For use, the plates are softened by warm water, and by this means and strong compression even the parings are able to be agglutinated together, and turned to good account. The coriaceous turtle, or luth, *Sphargis coriacea*, is covered with a coriaceous or leathery skin, instead of hard scales, and grows to a large size, individuals having been known to weigh from 1,500 to 1,600 lbs., and measure 15 feet in circumference and 7 feet in length. It is an inhabitant of the Mediterranean; and it is said that Mercury took the first hint for the construction of a lyre from the dried carapace and tendons of an individual of this species. The flesh is not good eating; but the shell is used by the inhabitants of the countries where it is found for making small boats, drinking troughs for domestic animals, and baths for their children. Occasionally, specimens weighing 700 or 800 lbs. have been thrown on the coasts of England. The loggerhead turtle, *Caouana caretta*, is also occasionally stranded on our coasts. It is a large species, and is carnivorous, feeding upon molluscous and radiated animals. It is of no value as an article of food, or as affording any tortoise-shell, but yields a considerable quantity of oil, which is used for lamps, &c. The species of the family *Trionycidæ*, soft turtles, or river turtles, have their shell covered with a hard, cartilaginous skin, usually expanded and flexible on the edge, and a long neck, which they can retract at pleasure within the carapace. They swim with much ease, and at night come to repose on islets, rocks, fallen trunks of trees, and floating timber. Very voracious and agile, these animals pursue, as they swim, reptiles, especially young crocodiles, and fishes. The flesh of the *Trionyx ferox* is con-

sidered very delicate; and on the coasts of North America, of which it is a native, it is angled for with a hook and line, baited with small fish or other living animals. They are said to be able to dart out their head and long neck with the rapidity of an arrow, and bite very severely. The species of the family *Chelididæ* have a depressed head and a long neck, which they are unable to retract within their carapace, but have it bent under the side of the shell in repose. They are carnivorous, preying upon living animals, such as molluscs, annelides, and batrachians. They only feed in the water, and swim with the whole carapace under the surface. The *Chelodinæ* have long, swan-like necks, and a small head, with fierce-looking eyes, bearing a somewhat fanciful resemblance to the ancient *Plesiosauri*. The genus *Chelys* is readily distinguished by the flat head and the neck furnished with long, cutaneous appendages. The matamata, *Chelys matamata*, is of a singular and somewhat hideous appearance, from its large, depressed, somewhat triangular head, its deeply cleft mouth, and rounded thick jaws. The neck is furnished with several long, cutaneous appendages, and it has two fleshy barbles on the chin. It is a native of the fresh waters and marshes of Brazil and Guiana, is two or three feet long, and its flesh is in good esteem.

Chelys matamata—The Matamata.

The terrapins, or family *Emydidæ*, have a depressed head, and their neck can be wholly retracted within the carapace. They have large eyes, and a beak a good deal resembling in form that of a bird of prey. They swim with great facility, and when on land, move with much more quickness than the land tortoises. Their habits are very nearly the same as the preceding family. The painted emys, *Emys picta*, is one of the prettiest species of this family. It is of a brown colour, with each scale encircled with a broad, yellow, or red riband, and is a native of North America, where it may be seen upon rocks or trunks of trees, from which it drops into the water on being approached. The box tortoise, *Cistuda Europœa*, is the most widely diffused, inhabiting all the south and east of Europe as far as Prussia. It attains a length of ten inches, and its flesh is eaten, with a view to which it is fed upon bread and tender herbage, though its ordinary food consists of aquatic insects, slugs, small fishes, &c. It is stated that its eggs require a year to hatch. The alligator terrapin, or long-tailed tortoise, *Chelydra serpentina*, has a large head and great limbs, rendering it difficult to withdraw them within the shell. The tail is long and large, with a central longitudinal series of rather compressed tubercles. It inhabits the warm regions of North America, and is very destructive to fish and water-fowl. This family contains a great many species. In these four families just mentioned, the feet are palmated or fin-shaped, enabling them to live in the water. In the family of land tortoises, *Testudinidæ*, however, the feet are club-shaped, and their habits are terrestrial. The shell is very solid, thick, ovate, and in the adult state covered with horny, concentrically grooved shields, marked with a permanent areola. They have a short, thick tail, are very slow in their motion, and live upon vegetables and roots. Most of the species are natives of warm regions of the globe; but those that live in colder climates burrow and sleep during the winter. They are quiet, inoffensive animals, extremely tenacious of life, and remarkable for longevity. Individuals are stated upon good authority to have lived upwards of 200 years! The common tortoise, or tartaruga, *Testudo græca*, is a native of the south of Europe, and almost all the countries bordering on the Mediterranean. It is found in the islands of the Archipelago, Corsica, Sardinia, and in Africa, and is thought to be more common in Greece than elsewhere. It is from six to eight inches long, and weighs about forty-eight ounces. This species is often brought to this country, and kept in gardens. One was brought to the archiepiscopal garden at Lambeth, in the time of Laud, in 1633, where it lived till 1753, owing its death then more to neglect than the effect of age. The Indian tortoise, *Testudo indica*, a native of India, and very abundant in the Galapagos islands, grows to a great size, frequently measuring three feet and upwards in length. The animal is very strong, and can carry great weights. The flesh is good, and largely employed by the natives, both fresh and salted, and a beautifully clear oil is prepared from the fat. Fossil remains of *Chelonia* have been found in abundance in various parts of the world. A considerable number of species have been ascertained to have existed in this country. Footprints and impressions of the shields of the carapace of one or two species of land tortoises are observed in the new red sandstone in Scotland, and of fresh water tortoises in the new red sandstone of Cheshire; whilst not fewer than twenty-two British species of sea and fresh water chelonians have been described as existing in the eocene formations of England and the London clay. A gigantic species of land tortoise occurs in the tertiary formations of India, the carapace of which measures twelve feet in length. This species, *Colossochelys atlas*, was

found associated with the remains of gigantic extinct mammalia, belonging to the *Pachydermata*.

Chelonia. *The Turtle.*—A genus of reptiles. See preceding word.

Cheloniidæ.—A family of reptiles. See CHELONIA.

Chelura.—A genus of crustacea belonging to the order *Amphipoda*. A species called *C. terebrans* was discovered some years ago at Trieste boring into wood work in sea water. The same or a closely allied species has since then been found at Ardrossan, in Scotland, and in Dublin bay in Ireland. In its ravages upon wood work, it may yet prove nearly as destructive as *Limnoria terebrans*. See LIMNORIA.

Chelydidæ.—A family of reptiles. See CHELONIA.

Chelydra.—A genus of reptiles. See CHELONIA.

Chelys.—A genus of reptiles. See CHELONIA.

Chen (χην, a goose).—A genus of birds. See ANSERES.

Chenalopex (χην, a goose; αλωπηξ, a fox).—A genus of birds belonging to the order *Anseres*, and family *Anatidæ*. The only species known, *C. Ægyptiaca*, the Egyptian goose, has long legs and a small spur on the shoulder of the wing. It is a native of the south of Europe and North Africa, is very abundant in the valley of the Nile, and is the goose so often figured on the Egyptian monuments. It is prettily coloured, and is of an elegant form.

Chenopodiaceæ (χην, a goose; πους, foot). *The Goose-foot family.*—A nat. order of dicotyledonous plants containing numerous species, many of them used for culinary purposes or for making soda. Sixty-seven genera and 372 species are enumerated, natives of all parts of the world in waste uncultivated places, but mostly found in temperate regions. The spinage, *Spinacia oleracea*, belongs to the family, and is well known as an excellent pot herb. The various species of beet also belongs to this family. See BETA. The genus *Chenopodium* is the type of the order, and contains upwards of sixty species, many of which are interesting from their economical and pharmaceutical qualities. They are spotted all over with small glands of a farinaceous appearance, containing a particular essential oil, which in some of the species has a fetid odour. *Chenopodium botrys*, a native of France, is possessed of a strong aromatic odour, and has been used on the continent in cases of hysteria and in chronic catarrhs. *Chenopodium* (*Ambrina*) *anthelminticum*, a native of North America, yields a volatile oil which is employed in that country as a vermifuge. *Chenopodium ambrosioides* is a native of Mexico, and is commonly called Mexican tea. The leaves give out by infusion an agreeable, slightly exciting drink, used all over South America, and called *Maté*. *Chenopodium quinoa*, a native of Chili and Peru, growing at a great elevation, particularly on the high table land of Chiquitos, 13,000 feet high, is used by the inhabitants, the leaves as spinage, and the seeds in soup under the name of petty rice. In some parts of South America the seeds of the quinoa are as much used by the natives, as rice is in India; indeed, they are said to be of as much importance to the Peruvians as the maize, potato, and wheat. The natives know how to extract from the leaves a good sort of beer. *Chenopodium Bonus Henricus*, Good King Henry, or English mercury, is a native of Britain, and its leaves are used as a substitute for spinage. When collected young and properly cooked, they are scarcely to be distinguished from the real spinage. The leaves are applied to ulcerated legs, and an ointment made from them is a favourite nostrum in some of our rural districts. Many of the species of the family grow in salt marshes and on the sea shore. They yield a quantity of soda. The genera *Salsola* and *Salicornia* contain plants which were formerly much used in the manufacture of soda. The plant which is considered by botanists to be the true mustard tree, σινηπι or σιναπι of Scripture, *Salvadora persica*, has been referred to the Chenopodium family. The tree grows in Syria, and has been also found in Ceylon. Its root is acrid, the succulent fruit has the taste of cresses, and its seeds are very small.

Chiasognathus.—A genus of exotic, brilliant stag-beetles. See LUCANIDÆ.

Childrenite.—A mineral named after the late Mr. Children, and found in the George and Charlotte mine at Tavistock. It occurs in small yellow rhombic octohedrons, of considerable hardness, and is composed of phosphoric acid, aluminum, and protoxide of iron.

Chilognatha (χειλος, a lip; γναθος, a jaw).—An order of annulose animals belonging to the class *Myriapoda*, characterized by having the body crustaceous, cylindrical, furnished with very short feet which are distributed in single pairs upon the anterior, and in double pairs upon the other segments, and always terminating in a single hook. Antennæ two, short and composed of seven articulations. The animals of this order crawl slowly or rather glide along the ground, and when touched roll themselves up into a ball. They live upon decaying animal and vegetable matters, and moult or cast their skin at stated periods. The young, when first hatched, are destitute of feet. This order contains three families, *Glomeridæ*, *Pollyxenidæ*, and *Iulidæ*. The species of *Glomeridæ* are of an oval form, and resemble wood-lice; they live under stones in hilly places. Those of *Pollyxenidæ* are soft, and the body is terminated by pencils of small scales. They live in crevices of walls, and under old bark. The *Iulidæ* are cylindrical and very long. When they roll themselves up, the firmness of the rings of the body enables them to resist considerable pressure. Some species are found under stones.

others in the earth, and some inhabit nuts. The most common is the *Iulus sabulosus*, about an inch and a quarter in length, and of a polished brownish-black colour with whitish legs. The adult has in general 120 legs on each side. The largest species known is the *Iulus Indus* or *maximus*, which is from six to seven inches long. It is a native of South America and the warmer parts of Asia, inhabiting woods and other retired places. These animals are very harmless to man, and may even be said to be beneficial from their consuming vegetable substances which are in a state of decomposition.

Chilopoda (χιλιοι, thousand; πους, foot).—An order of annulose animals, belonging to the class *Myriapoda*; characterized by having the body depressed, membranous, composed of numerous segments, which are covered above and beneath with plates of a horny substance. Each segment is generally furnished with a pair of legs, the last of which are thrown back and prolonged in the form of a tail, and the antennæ are slender, and consist of fourteen joints or more. The animals of this order are scattered all over the globe, run very quick, are carnivorous and nocturnal. They are found under moist stones, logs of wood, bark of trees, or in the ground. Some of the species are phosphorescent at night. Others, inhabiting hot climates, are of large size, and are held in great dread by the natives, from their poisonous qualities. This order contains four families—the *Cermatiidæ*, *Lithobiidæ*, *Scolopendridæ*, and *Geophilidæ*. The two first families have the body divided into fifteen segments, and have fifteen pairs of feet. The two last have at least twenty-one pairs of feet, and sometimes many more. The centipedes, *Scolopendræ*, conceal themselves under the decayed bark of trees, decayed timbers of buildings, among rubbish, &c., and sally forth at night in quest of their prey. In the West India Islands and the hot parts of South America, they grow to a large size, and become formidable pests. They bite very severely, the wound being not only exceedingly painful at the moment, but followed by a high degree of local inflammation and irritable fever. Some grow to the length of five or six inches. These have in general twenty-one pairs of feet. The *Geophili* are longer and narrower than the Scolopendræ, in proportion, and have forty-two pairs of legs. Some species are said to be electrical.

Chimaphila.—A genus of dicotyledonous plants, belonging to the *Pyroleæ*, a sub-family of the nat. ord. *Ericaceæ*. The corymbose winter-green, *C. corymbosa*, a small, evergreen, woody plant, common in the pine forests of the north of Europe, Asia, and North America, possesses various qualities, which are known to the Indians, and is much esteemed by them. It is a tonic diuretic, and has been found of use in dropsies following upon acute diseases. The leaves are generally used in decoction. They contain tannin, resin, and an acrid extractive.

Chimeridæ.—A family of cartilaginous fishes, nearly allied to the *Squalidæ*, or sharks, but differing from them in the configuration of their gill cavity. They obtain their name from the singular appearance of their head, rendered more *outré* by their having a fleshy process between their eyes, ending in a group of small spines. The females lay very large eggs, with a coriaceous shell, of an ovate, lanceolate shape, and a fringed edge. Their teeth consist of large, very hard, osseous plates, four or five in the upper jaw, and two in the lower. Two species are known, one inhabiting the northern and the other the southern seas. They live in the deepest recesses of the ocean, and prey on smaller fishes and mollusca. *C. borealis* is from three to four feet long; its flesh is coarse, and unfit to be eaten. At night its eyes are brilliant like those of the cat, whence, in the Mediterranean, it is called the sea-cat. It is often seen lurking among the shoals of herrings; and the Norwegians call it the king of the herrings. They salt its roe, and express an oil from the liver, which they employ for certain diseases of the eye; of the tail they make pipe-pickers.

Chimonanthus.—A genus of plants. See CALYCANTHACEÆ.

Chinchilla.—See CHINCHILLIDÆ.

Chinchillidæ.—A small family of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*. The family consists of three genera, the species of which are all natives of South America. The genus *Chinchilla* contains one species, *C. lanigera*, a native of Chili and Peru, and of the size of a squirrel, or measuring about nine inches in length, exclusive of the tail. The chinchilla is chiefly remarkable for its fine fur, which is very soft, and of a pearly-gray. An extensive trade has been carried on for many years in the skins of these animals; and for muffs, tippets, lining to cloaks and pelisses, &c., they are sold in this country at a comparatively high price. The import of skins into England, in 1851, was 85,000, of which 13,000 were re-exported. The head of the chinchilla resembles that of the rabbit; the eyes are full, large, and black; the ears broad, naked, rounded at the tips, and nearly as long as th head; and the tail is about half the length of the body, covered with long, bushy hairs, and usually kept turned upwards towards the back. The fur is long, thick, close, woolly, somewhat crisped and entangled together; and the moustaches are plentiful, and some of them twice the length of the head. These interesting little creatures live in holes under ground, are very sociable, and of a very gentle, timid disposition. They are found in considerable numbers in some of the mountainous districts of Chili and Peru, living principally upon bulbous roots. They are hunted by the natives with dogs, which are trained so as not to injure the fur when they seize them. The species of the genus *Lagotis* (or *Lagidium*), of which there are two described, have a remarkably

fine fur also; but the hair is so loosely attached to the skin that it readily falls off, unless handled with care. The skin of these creatures, therefore, is much less valuable than that of the chinchilla. They live in holes in the ground, and congregate in considerable numbers, feeding upon the herbs and shrubs that grow among the rocks, eating in a sitting posture. They are very active, are about the size and appearance of a rabbit, but have a long tail. The viscacha is a species of the genus *Lagostomus* (*L. trichodactylus*), and a native of the Pampas. It is very common in the neighbourhood of Buenos Ayres, and lives in burrows, in society. They are nocturnal animals, living in their retreats during the day, and coming out in the evening to the mouths of their holes, where they quietly sit on their haunches. They are about the size of a hare, are quick in their motions, and live on roots. The viscacha has a very peculiar habit, the object of which it is difficult to conjecture. It picks up every hard object lying in its way, and drags it to the mouth of its burrow. Bones of cattle, stones, thistle stalks, hard lumps of earth, dry dung, &c., are collected in this way, making a heap large enough to fill a wheelbarrow. The burrows made by these animals are dangerous traps for horsemen riding incautiously. They are tenanted also by a small species of owl, which is said to sit in large numbers during the day gazing at the passing traveller, and making a very ludicrous appearance.

Chiococca (χιων, snow; κοκκος, a berry). *Snowberry Tree.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Rubiaceæ*, and sub-family *Cinchoneæ*. The species, of which there are seven or eight known, are natives of the West Indies and equinoctial America, and several of them contain active properties. They are shrubs, with rather a climbing habit, and the fruit consists of a snow-white berry. The root of *C. racemosa* has an acrid, bitter taste, and has long been used as a strong resolutive or attenuant; it is also administered in obstinate rheumatisms, and is also an excellent emetic. The root of *C. anguifuga* is esteemed in Brazil as a certain antidote for the bite of serpents; and an infusion of the bark is a powerful drastic, being violently purgative and emetic.

Chionanthus (χιων, snow; ανθος, a flower). *The Snow Tree.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Oleaceæ*, and containing eight or ten species, scattered over North and South America and Asia. They are shrubs or trees. *C. virginica* is called the snow tree, from the great quantity of white flowers with which its branches are covered. They are in panicles, and exhale a sweet odour. The berry or drupe is about the size of a small olive. The bark is very bitter, and both it and the roots are used by the inhabitants in the cure of intermittent fevers.

Chirocephalus (χειρ, a hand; κεφαλη, head).—A genus of *Entomostraca*, belonging to the order *Phyllopoda* and family *Branchipodidæ*. The species of chirocephalus are of an elegant form, and possess exceedingly graceful movements. The *C. diaphanus* is not uncommon in England. It is about an inch in length, of a rather slender, cylindrical figure. The body is almost transparent, and in the male has a slight red tinge; the tail is of a bright red colour, and the large antennæ with which it is endowed are of a beautiful transparent blue, tipped at the extremity with delicate red. It swims on its back, and whether in motion or at rest, the branchial feet are in constant action, with a graceful, wavy undulation, exceedingly agreeable to the view. The young undergo a series of changes before they arrive at maturity.

Chironectes (χειρ, hand; νηκτης, a swimmer). *The Yapock.*—A genus of marsupial animals, with webbed feet. See DIDELPHIDÆ.

Chironectes. *The Hand Fish.*—A genus of acanthopterygious fishes, natives of the warmer parts of America and the Indian seas. See LOPHIDÆ.

Chironomus.—A genus of dipterous insects, belonging to the family *Tipulidæ*. The species are very numerous, frequenting marshy situations, and resemble small gnats. Upwards of eighty have been described as British; and they are known in this country by the name of *midges*. The larva of *C. plumosus* is well known to anglers, under the name of blood-worm. This larva is about half an inch in length, the body consisting of numerous segments, and furnished at the tail with several appendages, which constitute the breathing apparatus. It is seen in the summer months in the mud, on the edges of pools, often in great quantity, and forms a favourite food of birds and fishes. A species of fly, resembling the house fly, also devours numbers.

Chirotes.—A genus of saurian reptiles, natives of Mexico. See AMPHISBÆNIDÆ.

Chitine (χιτων, a tunic).—A horny substance, which gives firmness to the tegumentary system and other parts of crustaceans, spiders, and insects, entering into their composition to the extent of one-fourth. The lorica of the rotatoria probably also consists of this substance. It is dissolved by concentrated mineral acids, but is not soluble in solution of potash even when boiling.

Chiton.—See CHITONIDÆ.

Chitonellus.—See CHITONIDÆ.

Chitonidæ (χιτων, a tunic, or coat of mail). *Sea Wood-lice.*—A family of molluscous animals, belonging to the class *Gasteropoda*, and characterized from all others by having, instead of a single shell, a row of shelly valves, like plate armour, arranged in a regular series down the middle of the back. The animal has a broad, creeping disk like the limpet, and the posterior shelly plate is considered homologous with the shell of that animal, the other plates appearing to be portions of it, successively detached. These shelly valves are inserted into the mantle of the

animal, and the border of the mantle is either bare or covered with minute plates, hairs, or spines. More than two hundred species are known occurring in all climates throughout the world; most abundant on rocks at low water, but frequently obtained by dredging in from ten to twenty-five fathoms water. They are divided into several genera. In *Chiton* the border of the mantle is tesselated with small scales or plates. In *Acanthopleura* it is covered with spines or elongated scales. In *Tonicia* it is bald and cartilaginous on the upper surface, and on the under side covered with a very hard, striated skin. In *Acanthochites* the border is ornamented with bundles of fine bristles, placed on each side of the valves; and in *Mopalia* it is quite covered with hairs. The genus *Katharina* is distinguished by the mantle covering the whole shell, except the centre of the plates. In *Cryptochiton* the valves are entirely covered with a peculiar scaly epidermis; and in *Chitonellus* the shelly plates are small, distant from each other, and nearly hidden in the mantle, the border of which is velvety. Fossil species of chiton occur in the silurian formation; and three have been found in the crag in Britain.

Chlamydera.—The spotted bower bird. See PTILONORHYNCHUS.

Chlamydosaurus (χλαμυς, a mantle; σαῦρος, a lizard). *The Frill Lizard.*—A genus of saurian reptiles or lizards, belonging to the family *Agamidæ*. Only one species is known, *C. Kingii*, a native of Australia. It is an extraordinary looking animal, about ten inches long, exclusive of the tail, which is twelve. The head is five and a-half inches long and one inch broad, and has a curious crenated membrane like a frill round its neck, covering its shoulders; and when

Chlamydosaurus Kingii—Frill Lizard.

expanded, which it is enabled to do by means of transverse, slender cartilages, it spreads five inches, in the form of an open umbrella. It is very irascible, and when frightened, it elevates this frill, and runs to a tree, where it makes a stand, and boldly defends itself against its opponent, biting fiercely.

Chlamydotherium (χλαμυς, mantle; θηριον, a beast).—A genus of fossil animals, belonging to the family of armadilloes. The cuirass of the species upon which the genus was founded was very similar to that of the encoubert (*Dasypus sexcinctus*), but its feet were those, though larger, of the cachicame (*D. novemcinctus*). The best known species, *Chlamydotherium Humboldtii*, is as large as the tapir; while the *C. giganteum* must have equalled the rhinoceros in size.

Chlamyphorus (χλαμυς, a mantle; φορεω, to carry).—A genus of animals belonging to the *Edentata* of Cuvier, and family *Dasypidæ* of Gray. It is called by the Indians *Pichiciago*. See DASYPINÆ.

Chlamys.—A genus of beetles. See CHRYSOMELIDÆ.

Chlora.—A genus of dicotyledonous plants, belonging to the nat. ord. *Gentianaceæ*, and containing, like the generality of the species of that family, a bitter principle, which renders its action on the system tonic. The yellow wort, *C. perfoliata*, is a native of England and Ireland; and though its tonic powers are not very strong, it may be used in such cases of debility as the gentian and the erythræa are employed.

Chloranthaceæ (χλωρος, green; ανθος, a flower).—A natural order of dicotyledonous plants, allied to the peppers, and containing species which are herbs or undershrubs, and have an aromatic, fragrant odour. There are three genera known. The genus *Chloranthus* is the type, and contains two species, which are natives of Java. *C. officinalis* grows in moist woods, at an elevation of 1,500 feet above the level of the sea, is a smooth shrub, three or four feet high, and all its parts are powerfully aromatic. The natives of the mountain districts employ the roots as a remedy for spasms, in fevers, and suppression of the functions of the skin, and in smallpox. It is an active stimulant.

Chlorion (χλωρος, green).—A genus of hymenopterous insects, belonging to the family *Sphegidæ*. The species are of a slim form, of a shining, metallic green or bluish colour, and are found in the warm parts of both hemispheres. *C. compressum*, an inhabitant of the Isle of France, is very useful to the natives in destroying cockroaches. They feed their larvæ with these insects; and it is for this purpose that they wage such a deadly war with them. The moment a chlorion sees a cockroach, it precipitates itself upon it, seizes it with its mandible and plunges its sting into the abdomen of its victim, nor leaves it till it is quite dead. It then drags the body to the entrance of its nest, and having cut off the wings and legs, pulls the carcase inside for its young to devour.

Chloris.—The Greenfinch. See FRINGILLINÆ.

Chlorite.—A mineral substance, sometimes called green earth, composed of silica, alumina, magnesia, and protoxide of iron, and occurring in masses of a granular texture, or in small, green, opaque scales or plates. It is found in the granitic and schistose rocks of the Alps, in the Tyrol, in the mountains of Bohemia and Scandinavia, and in quartz veins in the islands of Bute and Arran.

Chlorite Slate.—An impure variety of chlorite, occurring as a green, soapy slate, forming a subordinate bed in mica slate, and found abundantly on Lochfine, at St. Catharine's.

Chloritoide, or Chlorite Spar.—A mineral of a greenish-black colour, coarsely foliated, and composed of silica, alumina, and oxide of iron. It comes from the Ural Mountains.

Chlorococcum (*χλωρος*, green; *κοκκος*, a berry).—A genus of confervoid algæ, belonging to the tribe *Palmellaceæ*. The common green, powdery-looking stratum, seen on every old trunk, on all old palings, and other exposed woodwork, &c., is a species of this genus, *C. vulgare*. It is found everywhere; and calculating from the known size of the cells and its wide distribution, this would appear to be the most fecund alga in existence. There are three hundred millions of individuals on a square inch, a little more than a line thick, and such layers clothe almost every piece of unpainted timber and old trunk we meet with in the country. It is possible, however, that instead of being a distinct species of plant, these bodies are only the *gonidia* of lichens.

Chlorogonium.—A genus of *Infusoria*, according to Ehrenberg, belonging to the family *Astasiæa*. The individuals are exceedingly small, and are found in enormous numbers in pools and puddles, frequently as many as 10,000 being counted in a single drop. They are propagated by oblique spontaneous division, and also by a process of swarming. When this is the method, the internal substance acquires the appearance of a blackberry; the envelope breaks, and the swarm of young escape. These organisms do not admit colouring matter, or foreign bodies; hence they are probably not animals, but minute algæ.

Chlorophylle (*χλωρος*, green; *φυλλον*, a leaf). *Leaf-green.*—The green colouring matter of plants is so called. It has a granular form, floating in the fluid of cells, accompanied by starch grains, and is very distinctly to be seen in certain water plants, as the leaves of *Valisneria*. It is allied to wax in its nature, is soluble in alcohol and ether, is insoluble in water, and is developed by the agency of light. Chlorophylle is rich in oxygen. It was formerly believed that the presence of this matter was the certain characteristic of a vegetable; but latterly it has been ascertained that the green colouring matter of several animals is the same, or a closely allied substance.

Chloroporese.—A synonym of CONFERVOIDEÆ.

Chloroxylon (*χλωρος*, green; *ξυλον*, wood).—A genus of plants. See CEDRÉLACEÆ.

Chonnites.—A group of fossil substances, closely allied to sponges. They are found in the chalk of England and France, and some analogous living forms are found on the coast of Australia.

Choeropotamus (*χοιρος*, a pig; *ποταμος*, river).—An extinct genus of fossil pachydermatous animals, nearly allied to the hogs. From the remains which have been found in the gypsum beds of Paris, and the eocene formations of the Isle of Wight, this genus appears to be one of the links between the hippopotamus and hog tribe; and the species upon which the genus is founded must have resembled the peccary, though it was in all probability one-third larger.

Choiropotamus (same derivation as last).—A genus of living animals, belonging to the family *Suidæ*, or hogs. The species are natives of Africa. The name of this genus has been lately changed to *Potamochærus*. See SUIDÆ.

Choeropus (*χοιρος*, pig; *πους*, foot).—The pig-footed bandicoot. See MACROPIDÆ.

Cholœpus.—A genus of mammalia. See BRADYPIDÆ.

Chondracanthus (*χονδρος*, cartilage; *ακανθα*, a spine).—A genus of parasitic entomostracous crustacea, belonging to the family *Lerneadæ*. The species are not numerous, and are found attached to the gills of fishes, by means of two pairs of prehensile jaw-feet. The ordinary feet are transformed, when the animals are once fairly fixed upon their prey, into a series of digitated lobes or tubercles, giving them an exceedingly *bizarre* appearance, as if they were stuck over with horny spines. The males are extremely small, only about half a line long, and do not in the slightest degree resemble the females, to the lower extremities of whom they are always found adhering. One species, *C. Zei*, is found parasitic on the gills of the *Zeus faber*, or John Dory.

Chondropterygii (*χονδρος*, cartilage; *πτερυξ*, a wing or fin). *Cartilaginous Fishes.*—A division of fishes containing those species whose skeleton is of a cartilaginous nature, and not bony, and whose skull is composed of a single piece, without any suture. Some have the gill flap open, like ordinary fishes; others have the gills adherent to the outer side of the gill cavity, allowing the water to escape through a series of holes between each gill. To the first section belong the sturgeons, STURIONIDÆ, and chimæras, CHIMERIDÆ. To the second belong the sharks, SQUALIDÆ, the rays, RAIIDÆ, and the lampreys, PETROMYZIDÆ.

Chondrus.—A genus of algæ. See THALLOGENÆ.

Chordeiles.—A genus of birds. See CAPRIMULGIDÆ.

Chromion (χρωμα, colour).—A metal, discovered by Vauquelin in 1797. It is not found pure in nature, but occurs in the form of chromate of lead, or red lead ore, *Cupreo chromate of lead*, and more abundantly in the state of chrome iron ore, a compound of green oxide of chrome and of protoxide and peroxide of iron. The green oxide of chrome constitutes one of the best greens employed as a paint, especially for porcelain.

Chrysalidina.—A genus of *Foraminifera*, resembling the form of a chrysalis, and occurring in immense abundance at the mouth of the Charente.

Chrysalis, or Pupa.—The name given to the second stage of the young of most insects, into which they change from the state of larva, or caterpillar. In this stage of their existence they remain perfectly motionless, and without receiving any nourishment; the duration varying according to the species and seasons. During this period an elaboration is going on in the interior of the chrysalis, which gives to the different parts of the future insect the consistence necessary for breaking its envelope at the moment when all its organs shall have attained their perfect development. The form of the chrysalis or pupa varies much in the different families and orders. Amongst the lepidoptera, for instance, we find in the diurnal tribes, it has a more or less angular form, whilst in the nocturnal and crepuscular it is always round and cylindro-conical. Some are adorned with varied colours, many being totally gilded, or spotted with gold and silver; others are of a uniform colour, either black, dark chestnut, or yellowish. Some are green and black, and others are furnished with fascicles of coloured hairs. Some are suspended in the open air, others are enclosed in cocoons, while others again are buried in the ground. In most of the *Coleoptera* the chrysalis is furnished with short legs. In the *Lepidoptera* it has none; and in the locust tribe it differs little from the perfect insect, except in not having the wings complete. In the *Libellulæ*, or dragon flies, it is locomotive, but differs very much from the appearance of the perfect insect.

Chrysanthemum.—A genus of plants belonging to the nat. ord. *Compositæ*. The species are very numerous in the temperate parts of the earth, and one more especially, *C. sinense*, is cultivated to a great extent in our gardens. It is a showy handsome plant, a native of India and China, and as much esteemed and cultivated in its native country as it is with us. Two species are very common and troublesome weeds in our fields, the corn marigold, *C. segetum*, and the great white ox eye, or ox eye daisy, *C. leucanthemum*.

Chrysididæ (χρυσος, gold).—*Ruby-tail Flies.*—A family of hymenopterous insects belonging to the division *Terebrantia* and tribe *Entomophaga* or *Pupivora*. The species belonging to this family have a cylindrical body, and th under side of the abdomen is concave and capab of being applied to the breast, so that, whe alarmed, they can roll themselves up into a bal The abdomen is attached to the thorax by a ver short peduncle, and consists of from three to fiv segments only, the remainder being transforme into a tubular apparatus, retractile like the joint of an opera glass, and having the extremity fu nished *with a minute sting or ovipositor.* Th perfect insects are about the most lively coloure of all the hymenoptera, and may be compared t the humming birds. The females deposit thei eggs in the nests of other hymenoptera, such a bembex, osmia, &c., during the period when the are provisioning them for the support of thei own progeny. The larvæ are thus provided wit food in their early stages, though it would ap pear that, when the other larvæ have attaine nearly their full size, these parasitic young faste themselves on the back of the young of thei hosts and suck them to death. The species c the genus *Chrysis* are European, and though c but small or moderate size, are amongst the mos splendid of our native insects, being adorned wit brilliant metallic tints, blue and green being th usual colours of the head and thorax, and fier copper colour, or ruby, that of the abdomen *Chrysis ignita* is very common in this country and may be observed in the hottest sunshine fly ing and running with great vivacity on garde walls, palings, sandbanks, &c. It is in constan motion.

Chrysobalanus.—A genus of dicotyledon ous plants belonging to the nat. ord. *Rosacea* sub-order *Chrysobalaneæ*. There are several spe cies, consisting of trees, chiefly natives of th West Indies and South America, and having fruit like a plum. The fruit of *C. icaco*, calle the cocoa plum, is of an ovate roundish form about the size of a damascene plum, and gene rally of a purple colour covered with a sort c bloom. The skin is thin and the pulp white and the taste is sweet with some sharpness. I is eaten either raw or preserved in sugar. Ther are four other species, the fruits of all of whic are edible.

Chrysoberyl or Cymophane.—A minera of a green colour, occurring either massive o crystallized, its primitive form being that o right rectangular prisms, and found in granite in Connecticut, and in alluvium along with topaz in Brazil. It is composed of albumina and glucina, with a little protoxide of iron.

Chrysochloris (χρυσος, gold; χλωρος, green) *The Golden Mole.*—A genus of animals belonging to the class *Mammalia*, order *Ferœ*, and family *Talpidæ*. In habits and size they resemble very much our common mole. The muzzle, however, is truncated, and their dentition differs. They have very small eyes, no external ears, their body is short and heavy, and their tail is merely rudimentary. The Cape mole

C. capensis, is remarkable for having the hair of its skin, when seen in certain lights, of an iridescent hue, showing brilliant green, bronze, and coppery tints. It is said to be the only quadruped which possesses those changing colours by which so many birds, fishes, and insects are rendered brilliant.

Chrysomelidæ.—A family of phytophagous beetles belonging to the pseudo-tetramerous *Coleoptera*, containing 43 genera and 650 species, between 70 and 80 of which are natives of Great Britain. The greater number are adorned with rich colours, gold, red, copper, bronze, metallic green, deep blue, azure, violet, and silver—a very few only being of a sombre hue. The larvæ are naked, living fixed upon the leaves of plants or trees. In the perfect state these beetles live in repose during the day, attaching themselves to the stems of trees, or concealing themselves at the foot of plants, under the bark, or beneath stones. The species of *Doryphora* and *Phytodecta* take up their abode on the tops of lofty trees, under the leaves, and only come forth at night to seek their food. They walk slowly and unevenly. The species of *Timarcha* are destitute of wings, and when laid hold of or alarmed, emit a reddish fluid from the mouth and joints of the legs, whence they have obtained the name of bloody-nose beetles. Though these insects live upon plants, there are only a few that do much mischief to vegetation. A species of *Eumolpus*, *E. viti*, a small insect, not exceeding a quarter of an inch in length, inhabits the wine countries of Europe, and commits great devastation upon the vines. *Colaspis barbara*, a native of Spain, has also been noticed as destroying to a great extent the crops of Lucerne in that country. Amongst the most remarkable insects of the family are the species of *Chlamys*. Most of these are natives of Brazil, and are generally of small size. The thorax and elytra are usually very uneven, studded with numerous angular projections, and brilliantly coloured, so as to resemble pieces of minerals.

Chrysomitris. *The Siskin.*—A genus of birds. See FRINGILLINÆ.

Chrysopa.—A genus of neuropterous insects. See HEMEROBIIDÆ.

Chrysophyllum (χρυσος, gold; φυλλον, a leaf).—A genus of dicotyledonous plants belonging to the nat. ord. *Sapotaceæ*. About thirty species are known, indigenous to tropical America, of which several are cultivated in our hothouses. They are in general large trees, lactescent, and remarkable for the elegance of their appearance, and especially for the beauty of their foliage. The wood is hard and compact, and is used for building and other purposes. The best known species is the star apple of the West Indies, *C. cainito*. This tree grows to the height of from thirty to forty feet, and the fruit is globular, about the size of a large apple. It is cultivated in some parts of America, and several varieties are produced. The sweet, agreeable taste of the pulp causes this fruit to be much esteemed by the natives. The fruit of *C. microcarpum* is very sweet, and that of *C. monopyrenum*, which is remarkable for having only one seed, and is about twice the size of an olive, has a very agreeable vinous flavour.

Chrysoprase.—A variety of agate of a whitish-green colour, owing to the presence of the oxide of nickel. See AGATE.

Cicadidæ. *The Cicada family.*—A family of insects belonging to the order *Homoptera*, containing numerous species arranged in a good many genera, of which *Cicada* is the type. The species of cicada are distinguished by their having a thick body of a short robust form, and by the males possessing peculiar organs for producing the music for which these insects are so famed. These organs are internal, and placed at the base of the abdomen, beneath, and covered by two large flat plates. They consist of a pair of stretched membranes acted upon by powerful muscles, and the sound issues from two holes beneath the two covering plates, in a manner somewhat analogous to the action of a violin. The rudiments only of these organs are found in the females. The *Cicadæ* are natives of warm climates, not appearing in Europe beyond the forty-fifth degree of latitude. They are found in all the south of Europe, the whole of Africa from north to south, America nearly to the same parallel as in Europe, all the centre and south of Asia, New Holland, and Polynesia. The ancient Greeks and the Chinese, we are told, used to keep these insects in cages, as we do birds, for their song. They are frequently to be seen represented on the Egyptian monuments, and are said to be emblems of the ministers of religion. The song of the *Cicada* forms the subject of many of the poems of the Greeks, and Anacreon himself dedicates an ode to this insect. Notwithstanding their love for them, almost amounting to idolatry, they did not, however, hesitate to eat these insects, especially in the nympha state, and females loaded with eggs. The *Cicadæ* are amongst the largest species of the order to which they belong. Their wings are large and particularly covered with strong nervures. The females deposit their eggs, from five to seven hundred, in the dead or dried branches of trees, in holes which they bore by means of a very peculiar formed ovipositor. When first produced the young resemble fleas, and as soon as born they leave the holes where they were hatched and escape into the earth, where they undergo their transformations. The perfect insects live upon trees, sucking the juice of the leaves. The song of the cicadæ is long continued and monotonous, and in some species very loud, that of some Brazilian species being sufficiently so to be heard to the distance of a mile. One American species is distinguished for another quality besides that of its song. This insect is called in Philadelphia the seventeen

years' locust, *Cicada septendecim*, and is remarkable for the regularity of its appearance in the same localities at intervals of seventeen years. It has shown itself in the neighbourhood of Philadelphia, at intervals of seventeen years, ever since the year 1715, when its visit was first recorded, and during this long period of 140 years no causes have affected the regularity of its return, even to the month in which it has appeared. Only one species is found in Great Britain.

Cicer.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, tribe *Viceæ*. One species, called the chick-pea, *C. arietinum*, is a native of the Levant and Egypt, and is cultivated in the south of France for its seeds, which bear a resemblance to a ram's head. They have long been used as a common food in the East, and in some countries they serve, when roasted, as a substitute for coffee. The hairs which cover the plant transude, during the heat of summer, little viscid drops, which consist of pure oxalic acid, and which corrode the shoes and stockings of persons who walk through the fields where it grows.

Cichoraceæ.—A sub-order of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and characterized by the absence of albumen in the seed. The species are numerous, full of a milky juice, and inhabit the temperate climes of the western hemisphere. In some species the juice possesses powerful medical properties, and from others starch is procured in large quantities. This order is divided into eight groups or subtribes, and contains numerous genera, amongst which some are well known for the useful qualities they possess. The genera CICHORIUM, LEONTODON, LACTUCA, and HIERACIUM, may be taken as examples.

Cichorium.—A genus of plants belonging to the above-mentioned family, containing several species of considerable use to man. The endive, *C. Endivia*, appears to have been introduced into Europe from Japan or China in the year 1548. It is now much cultivated, especially in France, where it is much used as a salad, boiled in ragouts, fried with roast meats, and as a pickle. It grows wild in India, where it is called Kasnee. The wild succory or chicory, *C. Intybus*, which is a native of England and other parts of Europe, is very extensively cultivated, especially in the north of France and Belgium, for the sake of its roots, which are very much used to mix with coffee. It is also eaten as a salad, and when blanched, is sold in Paris under the name of *Capuchin's beard*, and is much esteemed for the table. In Italy it has long been much cultivated as a fodder for horses, cattle, and sheep, and is said to sweeten their blood, and preserve them from disease, and to cause cows to give more milk.

Cicindelidæ. *The Tiger Beetle family.*—A family of pentamerous *Coleoptera* belonging to the group *Geodephaga*, and containing many genera, of which *Cicindela* is the type. The species of *Cicindela*, about 200 in number, have a wide geographical range, being found in every quarter of the world, and are most frequently adorned with very brilliant metallic colours and bright clear spots. The head is strong, larger than the corselet, and the eyes are very projecting. They are carnivorous and exceedingly voracious, run with great swiftness, and their flight is very rapid though short. They are chiefly met with in sandy places exposed to the sun, where they may be seen searching after their prey, though a few appear to be confined to fields, running amongst the herbage, without using their wings. The larva of one species, *C. campestris*, or common green tiger beetle, abundant in this country, has been accurately watched. It burrows a cylindrical hole for itself in the sand, about eighteen inches deep, where it lies in ambuscade quite motionless, with its large jaws just raised above the surface and widely extended. The moment a luckless insect comes within its reach, it seizes it with its strong mandibles, and throws it down to the bottom of its pit, there to be devoured. Into this hole it retires the moment any danger threatens itself, and as soon as it begins to undergo its metamorphoses, it closes up the entrance. The largest insects in the family belong to the genus *Manticora*; the typical species of which, *M. tuberculata*, inhabiting the arid sandy plains of Southern Africa, is of a deep black colour, and destitute of wings. The species of *Megacephala*, though they have wings, make little use of them, but run with great agility. A Brazilian species of this genus hides itself beneath dry dung in the burrows of the *Onthophagi* and *Coprides*, where it remains during the heat of the day, endeavouring to defend the mouth of its hole, if an attempt be made to drag it forth. If this be persisted in, the insect soon descends to the bottom of its burrow, whence it may be drawn, by introducing a straw, which it immediately seizes, and will then allow itself to be drawn up forcibly rather than let go its hold.

Ciconia. *The Stork.*—A genus of birds. See ARDEIDÆ.

Ciconiæ. *The Stork family.*—A sub-family of birds. See ARDEIDÆ.

Cicuta.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, sub-order *Orthospermeæ*, and tribe *Ammineæ*. It contains only a few species, of which the water hemlock or cowbane, *C. virosa*, is the best known. This plant is a native of England and the north of Europe, growing by the sides of ponds and ditches. It is one of our most virulent vegetable poisons, its roots having been frequently mistaken for parsnips, and eaten with fatal consequences. The leaves are also fatal to cows and swine, though it is said horses and goats eat it with impunity. The best remedy against its deleterious effects upon man, when incautiously taken into

the stomach, is a speedy emetic, succeeded by vegetable acids or oils.

Cidaridæ.—A family of echinodermatous animals belonging to the order *Echinoidea*. They are distinguished by having the tubercle to which the spines are affixed, pierced with a central pit. Through this perforation a small muscle passes which is attached to the spine, and by means of which it is moved. This family is divided into a number of genera, and includes many species. The species of the genus *Cidaris* are more numerous than those of the other genera, and are the first to be met with in the fossiliferous strata, some occurring in the muschelkalk, and others in the jurassic formation. They are also found abundantly in the tertiary chalk beds. One recent species, *C. papillata*, or the piper, is a native, though a rare one, of the British seas, off the island of Zetland.

Cilia (*cilium*, a hair or eyelash).—Originally applied to designate the eyelashes of man and other mammalia, the term *Cilia* is now generally restricted to denote microscopic filaments like hairs, attached by one end to the surfaces of various parts of animals, and exhibiting a vibratory or rotatory motion. They are mostly found on tissues which are in contact with water, or which produce fluid secretions. During life they are usually in constant motion, and are found in all the classes of the animal kingdom. The motion is not very rapid, and consists of two kinds:—1st, a fanning or lashing movement, the cilium being bent in one direction, and returning to it again; and 2d, a slight movement upon themselves, each cilium turning on its own axis through the space of a quarter of a circle, with a movement like that of the feathering of an oar in rowing. The use of these organs seems to be, in the very small animals, such as the infusoria, rotatoria, &c., to act as organs of locomotion, and in the larger animals, as in the mollusca, &c., to cause a current in the water to bring food within reach, and at the same time to favour respiration and secretion. Cilia are structureless, no muscular structure being apparent. They are found existing also in plants, and though at one time their appearance was considered to form a characteristic of animals, we now find them, and in active motion, in almost all the flowerless plants, as in ferns, equisetaceæ, marsiliaceæ, &c., and in the algæ—in the latter occurring upon the zoosperms.

Ciliograda (*cilium*, a hair; *gradior*, to walk).—An order of marine animals. See ACALEPHÆ.

Cillenium.—A genus of beetles. See BEMBIDIIDES.

Cimbex.—See CIMBICIDES.

Cimbicides.—A sub-family of hymenopterous insects, belonging to the large family *Tenthredinidæ* or saw-flies. They are distinguished from the other saw-flies by having their antennæ short, club-shaped, and eight-jointed. The genus *Cimbex* is the type of this sub-family, and contains the largest species of all the *Tenthredinidæ*. They are of a strong make, and in general adorned with varied colours. Their flight is heavy, and while on the wing they produce a sort of humming noise. Their larvæ have twenty-two feet, and when alarmed discharge to a considerable distance a clear greenish watery fluid from lateral pores placed above the spiracles. They live on the leaves of trees, and when full grown, construct a strong parchment-like cocoon which they attach to the branches upon which they have been feeding. Several species of *Cimbex* are found in Great Britain.

Cimex. *The Bug.*—See CIMICIDÆ.

Cimicidæ. *The Bug family.*—A family of hemipterous insects belonging to the section *Geocorisa* or *Auricorisa*, and containing only one genus, *Cimex* or bug. The common bed bug, *C. lectularius*, is too well known as a domestic pest to require any description. It is commonly said to have been introduced into this country after the great fire of London in 1666, having been brought in timber from America; but it was known previously to that time, as Mouffet, an early writer, describes it in England in 1503 under the name of *wall louse*. The female bug lays her eggs in the beginning of summer, choosing the crevices of bedsteads and other furniture, or the walls of a room, in which to deposit them. The larvæ, when hatched, are small, white, and semi-transparent, of a different form from the parent insect, and take eleven weeks to attain their full size. Various means have been proposed for destroying these troublesome and disgusting pests—but cleanliness, paying particular attention to the period when the eggs are laid, is the most effectual. Bugs infest pigeons, swallows, bats, &c., and three species have been described in this country taken from the nests of these animals.

Cimicifuga (*cimex*, a bug; *fugo*, to drive away). *The Bug-wort.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Ranunculaceæ*, and sub-order *Actææ* or *Pæoniæ*. The species are herbaceous and perennial, growing principally in the northern parts of the two hemispheres. The roots act as drastic purgatives, and are poisonous. *C. fœtida*, or stinking bug-wort, is a native of the Carpathian mountains, Siberia, and the north-west coast of America. It is a very fetid plant, and the inhabitants of Siberia assert that, by means of placing branches of it in their houses, bugs are deterred from coming into the dwelling. *C. serpentaria*, (*Actæa racemosa*) black snake root or bug-wort, a native of North America, has a reputation in Canada and other parts for curing the bites of snakes.

Cimolite.—A grayish or reddish clay, being a hydrous silicate of alumina, found in the island of Argentiera or Cimola. It is soft and opaque, and is used for the same purposes as fuller's earth.

Cinchona. *Peruvian* or *Jesuits' Bark.* — A genus of dicotyledonous plants, forming the type of the nat. ord. *Cinchonaceæ*, and containing a number of species of great medicinal value to man, and generally known under the name of *Bark.* The cinchona trees are confined to a particular region, growing exclusively on the Andes within the boundaries of Peru, Columbia, and Bolivia, from 11° N. lat. to 20° S. lat., at elevations varying from 1,200 to 10,000 feet above the level of the sea, and preferring a dry rocky soil. There are at least twelve species, which are supposed to furnish the barks of commerce, but much obscurity prevails as to the precise species whence the different kinds of bark are obtained. Many of the best known sorts sold in the shops are in reality furnished by the same tree under different circumstances. The names of yellow, red, and pale bark have been very vaguely applied, and are by no means well defined; the yellow passing into the red, and the pale passing into the yellow by shades that cannot be distinguished. The barks are met with either in thick, large, flat pieces, or in thinner pieces, which curl inwards during drying, and are called quilled. Britain is said to import from 225,000 to 556,000 lbs. annually, and to retain 120,000 lbs. for home consumption. About twenty-six species are recognized by botanists, all possessing the same tonic, febrifuge, and astringent qualities, but not in the same degree, owing to the different proportions of the two alkaloids *Cinchonine* and *Quinine* contained in them, and to which their active properties are due. The chief official kinds of bark are, 1. The crown or loxa bark, a pale bark, occurring in quills from six to fifteen inches long. This kind is the produce of *C. Condaminea*, which inhabits the mountains in the vicinity of Loxa, at an elevation of from 5,700 to 7,500 feet, and is one in which *Cinchonine* predominates. This is now recognized as the species yielding the pale bark, *Cinchona pallida*, of the London pharmacopœia. 2. The gray bark, silver or huanuco bark, another variety of pale bark, and the richest in *Cinchonine* of all the species hitherto examined. This kind is the produce of *C. scrobiculata* or *micrantha*, a tree which grows in the vicinity of Huanuco, in Peru, and comes to us in the form of quills, generally from four to ten inches long. The pale barks are imported to this country in chests covered with skins, each containing about 200 lbs., well packed. 3. Yellow bark, called also *China regia* or *Quina Calisaya*, brought to this country partly in quills varying in length from four to twenty-four inches, and partly in flat pieces. In this variety of bark *Quinine* predominates. The species of cinchona, from which the yellow bark imported into England is procured, is not yet well determined, though that met with on the continent appears to be derived from the *C. cordifolia*, growing in New Grenada in 4° N. lat., at heights varying from 5,400 to 8,650 feet. Yellow bark is imported in chests containing from 90 to 100 lbs. each. 4. Red bark, *China rubra*, occurring partly in quills and partly flat. This kind is the produce of *C. oblongifolia*, a species growing on the Andes in 5° N. lat., at a height of from 3,600 to 7,800 feet, and contains *Cinchonine* and *Quinine* in about equal proportions. It is imported in chests containing from 100 to 150 lbs. each. Various inferior kinds of bark are met with in commerce, and several trees belonging to the family *Cinchonaceæ* yield a false bark with which true cinchona bark is adulterated. For the knowledge of Peruvian bark and its medicinal properties in curing intermittent fevers, &c., we are indebted to the Jesuits, hence it is often called Jesuits' bark. It was first introduced into Europe in 1632, but was not extensively used till the latter part of the seventeenth century. It was formerly administered in the form of powder, infusion, or tincture; but for some time past the more elegant preparation of disulphate of quina has superseded the other forms.

Cinchonaceæ. *The Cinchona Bark family.* — A family of dicotyledonous plants which were formerly included in the nat. ord. *Rubiaceæ.* This is an extensive and most important family, containing many of the most useful plants we are acquainted with. About 269 genera and 2,500 species are comprehended in it, all natives of the hotter parts of the world, where they are so abundant as to constitute not less than the one-twenty-ninth part of the whole of the vegetation. For illustrations of some of the most useful plants contained in this order see CINCHONA, CEPHAELIS, COFFEA, CHIOCOCCA. The genus *Exostemma* yields various kinds of false cinchona bark, which differ from the real Peruvian by wanting the cinchona alkaloids. Five species are noticed by botanists, and their bark is frequently used either as a substitute for the real bark, or for adulterating it. Many of the species of the family have very showy and fragrant flowers, those of *Cinchona magnifolia* smelling like the *Citrus aurantium.* The species of *Mussœnda* and *Calcophyllum* are remarkable on account of one of their sepals becoming large and showy, exhibiting a tendency to return to the condition of leaves, after the petals have fallen. A few species only yield food for man. The genipap is a South American fruit, as large as an orange, and with an agreeable vinous taste. It is the produce of *Genipa Americana.* Several genera yield colouring matters used in dyeing.

Cincinnurus.—A species of bird of paradise. See PARADISEIDÆ.

Cinclodes.—A genus of birds belonging to the order *Passeres*, tribe *Tenuirostres*, and family *Certhiidæ.* Five or six species are known, natives of Patagonia, Terra del Fuego, and Chili. Though they live on the sea shore, and

frequent estuaries, they ascend the rivers to a great distance inland, and are sometimes found even on the Andes. They are very gentle and fearless, and do not fly from the approach of man, but will allow him to come close to them, and even lay hold of them without showing symptoms of terror.

Cinclosoma.—A genus of birds belonging to the order *Passeres*, tribe *Dentirostres*, family *Turdidæ*, and sub-family *Timalinæ*. The typical species, *C. punctatum*, or ground dove of the colonists, is a native of Eastern Australia and Van Diemen's Land. It selects for its habitat the tops of little hills, dry and stony and covered with herbs and brambles. Its flight is very short, and it scarcely ever rises from the ground but merely to fly across from one valley to another, or from thicket to thicket. It runs, however, with great swiftness, and when suddenly disturbed rises heavily with a noise like that of a partridge. It seldom perches upon trees, though it may often be seen running along prostrate trunks. It feeds upon the ground, and lives there, hence its common name. It has no note, except a slight whistle. Its flesh is delicate. *C. castanotus*, another species, but very like the preceding, is found only in Western Australia—the two species being closely confined to their separate quarters. It prefers living in open plains amongst small trees, shrubs, and brambles, and is especially common in the forests of gum trees. It is very wild and difficult of approach.

Cinclus.—A genus of birds belonging to the order *Grallæ*, and family *Charadriidæ*, established in 1752. See CHARADRIIDÆ. The *water ouzel* is also referred by most ornithologists to a genus of the same name belonging to the family *Turdidæ*, but as the name *Cinclus* had been previously used, the water ouzel now forms the type of the genus *Hydrobata*. See HYDROBATA.

Cineras.—A genus of pedunculated cirthipedes belonging to the family *Lepadidæ*, two or three species of which have been found adhering to ships' bottoms from all parts of the world. They are found also on the coronulæ of whales, and on slow-moving fishes, turtles, sea-weed, &c. The genus *Otion* is synonymous with *Cineras*, and Mr. Darwin has united them under the generic name *Conchoderma*.

Cinnabar. *Sulphide of Mercury.*—A mineral substance, red, heavy, and brilliant, occurring in nature in quicksilver mines and various other places. It is an ore of quicksilver or mercury, in combination with sulphur. The best cinnabar is of a high colour, and that which comes from the Philippine Islands is said to be the highest, though what we obtain from Almaden, in Spain, is the richest. Cinnabar is also obtained by a chemical process, and then constitutes the *vermilion* of commerce.

Cinnamomum. *The Cinnamon Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Lauraceæ*. This genus contains several species, all of them evergreen trees, and natives of India and China. Some of the species yield the well known substance called cinnamon, while others produce cassia. The cinnamon imported into this country comes from the island of Ceylon, and is the bark of *C. Zeylanicum*, a

Cinnamomum Zeylanicum—The Cinnamon Tree.

tree which attains the height of thirty feet. The best is derived from the middle-size branches and young twigs; is thin and rather pliable, a little thicker than royal or vellum paper, smooth and shining, and of a light yellow colour. It is brought home rolled up into quills or pipes about three feet in length, packed in bags or bales, weighing about ninety-two lbs. each, and the average quantity imported into London is estimated at 500,000 lbs. Till 1833 the production and sales of cinnamon in Ceylon was a monopoly of government, and its cultivation was restricted to a few gardens in the neighbourhood of Colombo. Now it is allowed to be cultivated by the natives anywhere, and in any way they think fit. The bark is not generally peeled till the tree is about nine years old, and the time for this operation begins in May and lasts till November. The root of the cinnamon tree yields a kind of camphor, the leaves an oil which resembles oil of cloves, the fruit a concrete oil called cinnamon suet, and the bark by distillation an oil called the oil of cinnamon, which at first is of a yellow colour, but soon assumes a reddish hue. Cinnamon is also procured in China and Cochin China from a species called *C. aromaticum*, and this kind is preferred in China to that brought from Ceylon. The annual imports of this variety of cinnamon into Canton and other ports vary from 250,000 to 300,000 lbs. Cassia bark or *Cassia lignea*, a substance resembling cinnamon in appearance, smell, and taste, and very often substituted for it, is the produce of another species of this genus, though it is difficult to say exactly which it is. Indeed it is now thought that cassia bark is merely inferior samples of cinnamon gathered in unfavourable seasons or from trees growing in bad situations. The chief import of cassia is from China *via* Singapore, and varies in ordinary years from 400,000 to 800,000 lbs. Cassia is

also brought from Borneo, Sumatra, and Ceylon. What is called Malabar cassia is most probably the bark of *C. eucalyptoides*, a native of India. Cassia yields a yellow volatile oil, which is at first whiter than oil of cinnamon, and though it becomes afterwards yellow, it is never of such a fiery yellow as cinnamon oil. Cinnamon and cassia were known to the ancients, and are both mentioned in the Bible. Cassia buds, which have the appearance of cloves but have the flavour and pungency of cassia, are the dried flower buds (perianth and ovary) of the same trees which produce the bark. They are imported from China, and are chiefly used in confectionery. The imports into Great Britain during the three years ending 1852, amounted to 35,913 lbs.

Cinnyris. *Sun Bird.*—A genus of passerine birds. See NECTARINIDÆ.

Circaetus.—A genus of birds. See AQUILINÆ.

Circe (a proper name).—A genus of bivalve shells. See VENERIDÆ.

Circinæ. *The Harriers.*—A sub-family of birds belonging to the order *Accipitres*, and family *Falconidæ*. This family of birds is characterized by the species having very long and slender tarsi, long rounded or even tails, and lengthened wings, with the third quills the longest. The sides of the head are furnished with a circle of feathers like the capital disc of the owls, and in some of the species the cheeks are naked. The harriers generally fly very low over marshes, and strike their prey upon the ground. The common marsh harrier, *Circus æruginosus*, is the type of the family, and is found throughout most of Europe, in Asia, and in Africa. It is not uncommon in this country, choosing marshy places for its habitation, and feeds upon water birds, reptiles, fish, young rabbits, and small quadrupeds. When in pursuit of game it flies low, and as has been observed, it will beat a moor or other piece of ground with almost the regularity of a well trained pointer. The female builds her nest generally on the ground in a tuft of rushes, or coarse grass, or furze. The hen-harrier, *Strigiceps cyaneus*, is another species, nearly allied, remarkable for the collar on each side of the neck, formed by the tips of the feathers which cover the ears, and is equally wide in its geographical range. It skims along the surface of the ground after its prey, and is extremely destructive to young poultry and the feathered game. It occurs in this country, and, like the last, builds its nest on the ground.

Circus. *The Marsh Harrier.*—See CIRCINÆ.

Cirrhigrada (*cirrhus*, a lock of hair or curl; *gradior*, to walk).—An order of marine radiated animals provided with cirrhi on the disc upon which their organs are disposed. See ACALEPHÆ.

Cirripedia — Cirrhipeda — Cirrhopoda (*cirrhus*, a lock of hair; *pes*, or *πους*, a foot). *Barnacle Shells* or *Sea Acorns.*—An order of *Crustacea*, till lately arranged amongst the *Mollusca*, and at one time placed amongst the *Echinodermata*. The cirripedes are articulated animals, contained within a hard covering, composed of several pieces, and consisting of laminæ of calcified chitine. The body of the animal is enclosed in a sac lined with a most delicate membrane of chitine, which in one group is prolonged into a peduncle, and contains the ova. The body is distinctly articulated, and is placed with the back downwards. The part which is called the abdomen has two rows of fleshy lobes, each furnished with long horny appendages, provided with many-jointed curled hairs or cirrhi, to the number of twelve pairs, which are constantly being protruded and withdrawn again through an aperture in the shell. They are the feet of the animal transformed into these organs, and by means of them a current is produced in the water which attracts to the mouth the objects which serve as food. The cirripedes have mandibles and jaws very similar to other crustacea, and recent observations prove them to be possessed of eyes. Their nervous system is composed of a double chain of ganglia disposed as in other articulated animals, and they have a double circulation of blood, the heart being lodged in the dorsal part of their body. They respire by means of branchiæ or gills, the form of which varies, and the greater part of them are hermaphrodite. Like the majority of the entomostraca, to which they are closely allied, the young undergo great changes in their progress to maturity. When first hatched from the egg they are exceedingly small, but when they have increased in size, they resemble the larvæ of the *Cyclopidæ*. They have two long antennæ, three pairs of legs, a pair of large eyes, and float freely in the sea, swimming rapidly with their back downwards. They soon become invested with a coriaceous bivalve shell like that of *Cypris*, their mouth becomes nearly obsolete, and they now begin to look out for a fit place to which to attach themselves. Having found this, they adhere to it by the part of the body near the head, and in a few days afterwards they throw off their external covering. The shelly valves then form, consisting at first exclusively of chitine; the antennæ disappear, being cemented to the surface of attachment; the eyes remain but in a more or less rudimentary form; three more pairs of legs are developed, and then the animal assumes its perfect state. During this time the cirripede, like the entomostraca, throws off its covering, or moults, at frequent intervals, and is very rapid in its growth. The greater part of the *Cirripedia* are arranged in two large families, the pedunculated cirripedes or LEPADIDÆ, and sessile cirripedes or BALANIDÆ. (See these words.) Besides these, there are others which differ materially from all the rest. The one set are remarkable for burrowing into

the substance of other shells, and entirely concealing themselves in chambers of their own formation, which are lined with a calcareous deposit, such as the genus *Alcippe*. Another set still more remarkable are parasitic upon other cirripedes, living in the sac, and attached to it by two distinct threads (such as the genus *Proteolepas*). The fossil cirripedes are numerous, but do not appear to differ widely from the existing forms. They are most abundant in the cretaceous formation.

Cirrus or **Cirrhus** (*cirrhus*, a curl or lock of hair).—A word employed by naturalists with different acceptations. Ornithologists use it to designate certain feathers which have no barbules. Icthyologists reserve it for the labial tentacles common in many fishes. Helminthologists employ it to denote important parts in annelides which perform the functions of touch, and which, showing themselves only in the cephalic rings, are similar to antennæ. The greater number of the animals belonging to this class possess them, though in some, as for instance the earth worms, they are wanting. The *Mollusca* have cirri, consisting of small filaments placed in a variable number upon the mantle. The bivalves offer many examples of them. The *Echinodermata* have the body more or less furnished with exsertile cirri of a vascular nature, and which are even more common than the spines. Botanists use the word to mean a slender, spiral, or twisted branch, which is also called a tendril, into which a leaf bud is occasionally developed, and by which plants are enabled to climb.

Cis.—A genus of beetles belonging to the family *Ptinidæ*. The species belonging to this genus are very small, and live in the interior of the coriaceous *boleti* found on the trunks of old trees, &c. They pierce the boleti in every direction, and at length reduce their substance to powder.

Cissampelos.—A genus of dicotyledonous plants belonging to the nat. ord. *Menispermaceæ*, containing about forty species, only some of which are as yet well known. They are for the most part twining shrubs, and grow in the intertropical regions of the globe. One of the species, *C. Pareira*, the Pareira brava, is a plant of much use in medicine, and is a native of the forests of the West Indies, Colombia, Mexico, and Brazil. The Brazilians use the juice of the fresh plant as a remedy against the bites of serpents. The root is much used in Europe as a tonic diuretic, and has been recommended in cases of chronic inflammation of the bladder. In all probability the roots of two or three different species of the genus are confounded under the name of Pareira brava, as several seem to possess the same properties.

Cissus.—A genus of dicotyledonous plants belonging to the nat. ord. *Vitaceæ* or *Ampelideæ*. This genus contains about 150 species, which are for the most part twining shrubs, and grow in all the tropical parts of the world, especially Asia. Several of the species contain such a quantity of pure water, fit to drink, that when cut in logs, they afford sufficient to quench the thirst of several people.

Cistaceæ. *The Rock-Rose family.*—A nat. ord. of dicotyledonous plants containing seven or eight genera, and upwards of 180 species. They are herbs or under-shrubs, having the leaves often covered with a fragrant viscous resinous secretion, and inhabit temperate climates. They especially abound in the parts of Africa and Europe bordering upon the Mediterranean. The genus *Cistus* consists of shrubs or under-shrubs, several of which are cultivated in our gardens for their beauty. They are evergreens, and effect a fine variety at all seasons, both from their leaves being of different figures, sizes, and shades of colour, and their being very profuse in elegant flowers, which, though of short duration, show a constant succession of new ones on the same plant for a month or six weeks. When several different species are employed they may be made to exhibit a constant bloom for nearly three months. In Spain these plants abound, and, along with some of the *Helianthemums*, they cover large portions of the country. One of the most common species, *Cistus Creticus*, the Cretan rock-rose, is the plant from which is obtained the fragrant gum known under the name of *ladanum* or *labdanum*. During the heat of summer this gum is so abundant that it distils from the leaves and branches, drop by drop, and falls on the ground, perfuming the air all round. It was formerly in great repute as a pectoral and stimulant, though now its use appears to be limited to an external application. It is a native of the Levant, and the gum is used by the Turks as a perfume. Many species which were formerly described as belonging to the genus *Cistus* are now arranged under the genus *Helianthemum*. *Helianthemum vulgare*, the yellow cistus, is a common native plant in Great Britain, adorning gravelly and rocky banks with its bright and gay blossoms, and being remarkable for the irritability of its stamens.

Cistuda. *The Box Terrapin.*—A genus of tortoises. See CHELONIA.

Cistus. *The Rock-Rose.*—A genus of plants. See CISTACEÆ.

Citrullus.—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*, and separated from the genus *Cucumis*. It contains about six species, all herbaceous annual plants, originating in Asia, but cultivated in Europe, some for the sweet taste of their red or white fruits, others for the bitter principle which they furnish to medicine. Of these latter, the coloquintida, bitter cucumber, or bitter apple, *C. colocynthis*, is much sought after by amateurs for the singularity of its fruit, the form of which has been so diversified by cultivation. Colocynth is one of our most drastic medicines, and is very much used in this country as a purgative. It is a native of the Levant; its fruit is about the

size of an orange, and when ripe it is peeled and dried in a stove, and in this state imported into this country. This plant is supposed to be the wild gourd of Scripture. Another species, *C. edulis*, furnishes an immense quantity of a sweet and refreshing juice.

Citrus.—The genus of plants to which the orange belongs. See AURANTIACÆ.

Cladium (κλάδος, a branch or twig).—A genus of monocotyledonous plants belonging to the nat. ord. *Cyperaceæ*. The common sedge, *C. mariscus* (= *Schœnus mariscus*), is the only European species, and though not a common plant in Great Britain, is very abundant in Cambridgeshire, where hundreds of acres in bogs and fens are covered by it, and where the people use it in some districts for lighting fires.

Cladocera (κλάδος, a branch; κέρας, a horn).—An order of animals belonging to the entomostracous crustacea. They are generally very small, and have the body, with the exception of the head, contained within a delicate transparent carapace, formed in the shape of two valves joined together on the back. They possess from four to six foliaceous branchial feet, have only one eye, and two pairs of antennæ, the lower of which are the organs of motion. Some which have five or six pairs of feet contained within the valves of the carapace, have the ova lodged in a vacant space left between the back of the animal and the dorsal portion of the shell. When the eye is single and large, and the intestine straight, they constitute the family *Daphniidæ*, and when the eye is accompanied with a black spot in front of it, and the intestine is convoluted, they form the family *Lynceidæ*. The species of both of these are natives of fresh water. Others which have four pairs of feet not contained within the valves of the carapace, have the eye very large, and the ova lodged in a large vacant space in the lower part of the shell. These constitute the family *Polyphemidæ*, the species of which are natives, some of the fresh water, as *Polyphemus*, and others of the sea, as *Evadne*. See DAPHNIA.

Cladonia (κλάδος, a branch or twig).—A genus of lichens to which the reindeer moss belongs. See THALLOGENÆ.

Claudestina.—A genus of plants synonymous with LATHRÆA.

Clausilia (*clausum*, a closed place).—A genus of *Mollusca* belonging to the pulmoniferous *Gasteropoda* and family *Helicidæ*. The shells are fusiform, slender, and sinistral, and when full grown have the aperture closed by a moveable shelly plate, or *clausium*, as it is called, in the neck. When the animal protrudes itself from the shell, it pushes aside this little plate, which on the animal's retiring, closes the aperture by its own elasticity. Above 200 recent species have been described, the greater part of which are natives of Europe, and about twenty fossil species are found in the eocene formations.

Clavagella.—A genus of conchiferous or bivalve mollusca belonging to the family *Gastrochænidæ*. The animal lives in a cylindrical, more or less elongated shelly tube, which is often furnished with a succession of siphonal fringes above, and terminates below in a disc with a minute central fissure, and bordered with branching tubuli. The valves of the shell are oblong, flat, often irregular or rudimentary, the left cemented to the side of the lower end of the tube, and the right always free. The genus was founded on a fossil species, of which thirteen have since been described. Six have lately been discovered in a recent state, living in masses of coral or stone.

Clavaria (*clava*, a club).—A genus of fungi belonging to the *Hymenomycetes*, and containing several kinds which are edible. They grow on the ground or trunks of trees, and the species are numerous. The one best known and most esteemed is *C. coralloides*, growing sometimes as large as a cauliflower, and its thick trunk dividing into branches like those of a coral. It is found in autumn in woods, and is of a pale yellow colour, sometimes varying with white or orange-red. Its substance is white, brittle, of a light mushroom flavour, and very pleasant taste. It is esteemed on the continent one of the best of the fungus tribe for the table, and is often pickled and preserved throughout the winter. *C. gyrans* has a pellucid stem, slender as a hair, which twists and untwists as the air is moist or dry; and *C. spatulata* has a head like the large end of a battledore, which, when ripe, upon being touched, throws up its seeds in form of smoke, rising with elastic force, and glittering in the sunshine like particles of silver.

Clavellinidæ.—A family of molluscous animals belonging to the class *Tunicata*, and called by some authors social ascidians. The animals which belong to this family occur in groups, consisting of several individuals, which are connected together by creeping tubular prolongations of the common covering through which the blood circulates. The family contains two genera, *Clavellina* and *Perophora*. The *Clavellinæ* have an elongated, erect, more or less pedunculated body, with a smooth covering, and so transparent that their structure can be easily seen through it. The branchial and oval orifices are without rays, and the thorax is usually marked with several coloured lines. They are propagated in two ways—by ova and by buds. The development of the young animal from the egg is much the same as in the family *Ascidiidæ*. When gemmation takes place, the buds and young animals are produced on the root-like processes which spring from the base of the parent, and tend to keep it in its position, at first in the form of elongate and claviform tubercles, and by degrees assuming the ascidian character. The *Perophoræ* are small, and live parasitic on confervæ &c., appearing to the eye like minute lumps of pellucid jelly, with a spot of orange and gray. The group of which they are composed consist

of several individuals, each having its own circulatory, respiratory, and digestive systems, but fixed on a pedicle that branches from a common creeping stem, and they are all connected by a circulation that exists in common. They are very transparent, so that their interior is easily seen, and their circulation is readily discerned through their tissues. The young of this genus have not yet been observed.

Claviger (*clava*, a club; *gero*, to carry).—A genus of pentamerous *Coleoptera* belonging to the family *Pselaphidæ*, and containing very few species. They are of a small size, and appear to be the most imperfectly organized of all the known coleoptera; the antennæ being only six jointed, the eyes seemingly wanting, and several parts of the mouth being obsolete. The *C. foveolatus* is found in general in the nests of the yellow ant, *Formica flava*, when these are made under stones. It is curious the little beetles are not looked upon as intruders by the ants, but appear to be received as friends, and are even fed by them out of their own mouths. It is understood, from repeated observations, that these small creatures secrete a peculiar fluid like that of the aphides, which is very much to the taste of the ants, and it is in order to obtain this that they treat their visitors so tenderly.

Clavulina.—A genus of *Foraminifera*. There are six species described, four recent, and two fossil, of a spiral form, with a round central opening in the terminal portion of the summit of the last compartment.

Clay.—Earths which break down or disintegrate in water, and afford a plastic, adhesive, ductile mixture. This property depends upon the presence of alumina, and clay is chiefly composed of this substance and silica, with a little protoxide of iron, and a small proportion of lime. There are many varieties of clay, and they are used for different purposes. Those of a coarser description are employed for the purpose of brick-making, while the finer kinds are used for making pottery. A metal which promises to be of great value has lately been obtained from common clay. See ALUMINIUM.

Claytonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Portulacaceæ*. Several species are known, herbaceous, succulent plants, with a fibrous root, or a tuberous rhizome, and growing in the arctic and sub-arctic parts of Asia and America. *C. perfoliata*, an annual, with perfoliated leaves, is cultivated on the continent, and used as a pot herb. It can be cut two or three times in summer. The tuberous roots of *C. tuberosa*, a native of Siberia, are also eaten.

Cleidothærus (κλεις, -ιδος, a clavicle; θηρ, -ηρος, an animal).—A genus of shells. See CHAMOSTREA.

Clematis. *The Virgin's Bower*, or *Traveller's Joy*.—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ* and sub-order *Clematideæ*, of which it is the type. It contains about 120 species, which are scattered over the temperate regions of the globe. They are climbing shrubs with slender stems, and the seeds when ripe are terminated by long feathery styles. The flowers in general are pretty; in some they are large, handsome, and ornamental, and many exhale a very sweet odour. Their vegetation is rapid, and they are thus well adapted for ornamenting walls, bowers, &c. *C. vitalba*, the common virgin's bower, or traveller's joy, a British species, and abundant also on the continent, is peculiarly well adapted for this purpose, though it possesses acrid properties which render it poisonous when taken into the stomach. The fresh leaves, when rubbed on the skin, produce inflammation and vesication, and are said to have been used in former times by beggars to give the appearance of foul ulcers on their legs and different parts of the body, for the purpose of exciting compassion and extorting alms from the credulous and benevolent. These ulcers being quite superficial were easily healed by an application of beet leaves, to preserve them from the influence of the atmospheric air.

Cleodora.—A genus of molluscous animals belonging to the class *Pteropoda*, and containing a great number of species, inhabiting chiefly the torrid zone. These animals are small, of a gelatinous substance, provided with two wings, or fins, and lodged in a slender shell transparent as glass. They are nocturnal in their habits, and soon after the sun is set, the surface of the ocean becomes covered with thousands, which sport at will during the evening and night, disappearing at the first break of day to reappear the following evening.

Cleome.—A genus of plants. See CAPPARIDACEÆ.

Clepsine.—A genus of annelides belonging to the family HIRUDINIDÆ.

Cleridæ.—A family of insects belonging to the pentamerous *Coleoptera*, and having as the type the genus *Clerus*. The insects of this genus are of an elongated, nearly cylindrical form, with club-shaped antennæ, head and thorax roughened with hairs, and elytra adorned with lively and decided colours disposed in transverse bands. They are found on flowers in the perfect state, but the larvæ live in the hives of bees, to which insects they prove very destructive. These larvæ are of a beautiful red colour, and as soon as the little creature is hatched from the egg it eats the grub of the bee in the cell in which it is born, and then proceeds from cell to cell devouring the inhabitants of each, till it arrives at maturity. *Clerus apiarius* selects the hive bee, and *C. alvearius*, the mason bees, osmia and megachile. Other species of this family, as *Opilus*, *Tillus*, and *Thanasimus*, are found upon and under the bark of old trees, dry wood, &c., and the larvæ of these live upon other insects which take up their abode in similar situations, such as *Anobium tesselatum*. &c. The species of

Necrobia, both in the perfect and larva state, feed upon carrion and dead animal matter, as dried skins, old bones, &c. One species, *N. ruficollis*, is found on the walls of prisons, and has been rendered famous from the interesting fact, that it was to it the celebrated entomologist Latreille owed the preservation of his life during the dreadful period of the French Revolution. He found it on the walls of his prison at Bordeaux, and it has since then been taken in profusion upon the walls of the Penitentiary at Westminster.

Clerus.—A genus of beetles. See CLERIDÆ.

Clinkstone.—A mineral substance. See PHONOLITE.

Clintonite.—A mineral resembling mica, but not so flexible, consisting of silica, alumina, magnesia, and lime, with a little iron and a small quantity of water. It occurs crystallized, and in imperfectly crystallized masses, and is found at Amity, Orange County, New York.

Clio.—See CLIONIDÆ.

Cliona (κλίνω, to close).—A genus of siliceous sponges. If we take up an old oyster shell, or even an adult living one, we may perceive the shell pierced with small round holes or tubes. These are made by small annelides, and are the chosen habitations of the sponges belonging to this genus. They insinuate themselves into the ramifications of these tubular holes, even the most delicate, and adhere in an intimate manner to their sides. The spiculæ of these sponges are siliceous.

Clionidæ.—A family of marine mollusca belonging to the class *Pteropoda*, and section *Gymnosomata*, or those pteropods in which the animal is naked, without mantle or shell. The genus *Clio* contains only a few species, which are characterized by having two wings, which are ovate, a mouth with lateral lobes, each supporting three conical retractile processes, furnished with numerous microscopic suckers, and an oblong, depressed body. One species, *Clio borealis*, inhabits the arctic seas, and when the weather is calm, is so abundant that the surface of the ocean is covered by them. They swarm in such myriads, indeed, that they serve as a great portion of the food of the whale, and are known to the whalefishers by the name of "whales' food." *C. australis* appears to be as abundant in the Antarctic Ocean as the other is in the northern seas. The genus *Pneumodermon* has a fusiform body, and the head furnished with two contractile arms, armed with peduncled suckers. Four species are known, distributed through the Atlantic, Indian, and Pacific Oceans. *Pneumodermon Peronii*, inhabiting the Atlantic Ocean, is about an inch in length; the fry have the end of the body encircled with ciliated bands.

Cloisonnarin.—A synonym of SEPTARIA.

Closterium (κλωστηρ, a spindle).—A genus of microscopic confervoid *Algæ* belonging to the *Desmideaceæ*. The species of this genus were considered by Ehrenberg and other naturalists as infusorial animalcules, and the typical species, *C. lunula*, was long ago described as a *vibrio*. They are generally of a spindle shape, curved like a crescent, and formed of two conical parts united by their base. The covering is membranous, smooth, sometimes striated or punctated, and some of the species are so abundant, that scarce a drop of water can be taken up from the bottom of a clear pool without some individuals being contained in it. They can fix themselves by one extremity to foreign bodies, and though no spontaneous movement can be observed in them, like all other vegetables, especially those which are free or floating, they direct themselves to the light, and a circulation may be seen in their interior, which is attributed to the action of cilia. They are reproduced in various ways, by self-division or conjugation. There are a great many species, found in tranquil fresh waters, clear ditches and ponds, in the midst of aquatic mosses, such as sphagnum, &c.

Clotho.—A genus of spiders. See ARANEIDÆ.

Clubiona.—A species of spiders. See ARANEIDÆ.

Clupeidæ. *The Herring family.*—A family of fishes belonging to the order *Malacopterygii*, characterized by their having a scaly body like the salmons, no adipose dorsal fin, and the upper jaw formed in the middle by the intermaxillary and on the sides by the maxillary bones. Some of the fishes of this family have the same habits as the salmons, entering rivers and ascending to a considerable distance in shoals to spawn; after which they descend to the sea. Many are edible, and being great articles of commerce, form the staple of several large towns in England and elsewhere. The occupation they give, and the nursery the fisheries for them afford to seamen, render them and everything connected with them, objects of great interest to the state. The herring, *Clupea Harengus*, is about ten or twelve inches in length, the upper part blue or green according to the light, and the sides, belly, and gill covers silvery-white. Herrings inhabit the deep waters all round the British coasts, and approach the shores in the months of August and September for the purpose of depositing their spawn, which takes place in October or beginning of November. They are found in the highest northern latitudes, and generally as low down as the northern coasts of France. The word herring is said to be derived from the German *Heer*, which signifies an army. The herring seems to have been unknown to the ancients, and the first authentic account we have of a fishery for them is in the Firth of Forth in 1153, during the reign of King David; and the Dutch are stated to have engaged in it about the year 1164. The invention of pickling or salting herrings is ascribed to one Beukels or Beukelson, of Biervliet, near Sluys, who died in 1397. The emperor Charles V. visited his grave, and ordered a magnificent tomb to be erected to his memory. In the year

1220, Yarmouth was the principal staple market for herrings on the British coast, a reputation which it still to a great extent enjoys. In the season of 1854, it was calculated that 19,000,000 herrings were caught off Lowestoff. This is equal to 27,000 barrels, and worth when cured as many pounds sterling. This, however, is inferior to the fishery at Wick, in Caithness. The average annual quantity taken amounts to from 100,000 to 120,000 barrels, valued at £1 per barrel. The larger portion of this is shipped for the German markets. The greatest number, however, are taken on the coasts of Norway and Sweden. In the first of these countries it is said that about 400 millions are taken in one year, and sometimes 20 millions in a single fishery. The pilchard, *C. Pilchardus*, is about the size of the herring, but thicker and rounder, and having larger scales. This fish is caught off the coast of Cornwall in great abundance, appearing about the middle of July and disappearing about Christmas. The pilchard fishery gives employment to about three thousand men, and in 1832 the capital employed in this trade was reckoned at from £200,000 to £250,000. It has not varied much in the interval since that time. The quantities of this fish are so great at times that a single sean net, which is generally from 200 to 300 fathoms in length, has been known to enclose at once as many as 3,000 hogsheads of fish! It is a saying of the Cornish fishermen, that the pilchard is the least fish in size, most in number, and greatest for gain, taken from the sea. The sprat, *C. Sprattus*, is another species of this genus, though many authors have confounded it with the young herring. It is about five inches in length, and the body is deeper in proportion than the herring. The sprats are very numerous, and ascend rivers in great shoals. They make their appearance in the Thames about November, following immediately after the herrings have disappeared. They come up nearly as high as London Bridge, are taken in large quantities, and form an important article of food for the poor during the winter. In some parts of our coasts they are so plentiful that they are employed as manure: The species of shad, *Alosa*, have the upper jaw notched in the middle, and two are natives of this country. The twaite shad, *A. finta*, is about fourteen inches in length, is of a brownish-green colour on the back and silvery below. The rivers Thames and Severn abound with this fish in summer; they ascend in May for the purpose of depositing their spawn, and descend to the sea about the end of July. They are caught in considerable abundance a little below Greenwich, though in former times they are said to have been taken as high up as Putney. The allice shad, *Alosa communis*, is considerably larger, reaching the length of two or three feet, and is chiefly found in the Severn, ascending as high as Gloucester. The flesh of this species is considered better than the former, which is dry and insipid. The whitebait, *Clupea alba*, is now ascertained to be a distinct species of this genus, though it was long considered to be only the young of either the shad or the sprat. It is caught in great abundance in the Thames as high as Woolwich and Blackwall, and the fishing commences about the beginning of April, and is continued till September. Whitebait dinners are too well known to need description; it is the young of the season that are taken for this purpose in such quantities in the Thames, but the adult fish are caught in the Firth of Forth, and are taken off the Kentish and Essex coasts during winter, of the length of six inches. The anchovy, *Engraulis encrasicolus*, is one of the last species of this genus we shall mention, and, as Lacepéde says, there is scarcely any fish better known to all who love good cheer. It is about four inches long, of a bluish-brown colour on the back and silvery-white on the belly. It is a native of England, being found in abundance off the Cornish coasts and the shores of Wales. It is said, that if attention were paid to the fishery, enough might be taken to supply the consumption of the British Islands. Notwithstanding this, we are indebted to the Mediterranean for our supplies, and the great fishery of anchovies is at Gorgona, a small island in the Tuscan Sea. They were known to the ancients, and were used both by the Greeks and Romans as a pickle or sauce, under the name of *garum*. On the coast of Sumatra, another species of this family, *Alosa toli*, is the subject of a very extensive fishery, for the sake of its roes, which are salted and exported to China, the dried fishes themselves being sent into the interior of Sumatra. The fish is named "trubu" in the Malay tongue, is about eighteen inches long, and between fourteen and fifteen millions are caught annually with very rude tackle.

Clusia.—A genus of dicotyledonous plants belonging to the nat. ord. *Guttiferæ* or *Clusiaceæ*; containing about thirty species which are shrubs or trees of an elegant appearance, usually parasitical, and abounding in a viscid resinous juice of a balsamic flavour, which becomes red when exposed to the air. They are in consequence called balsam trees, and are natives of the West Indies and South America. *C. rosea*, the rose-flowered balsam tree, growing to the height of from twenty to thirty feet, is an inhabitant of the Carolinas, St. Domingo, and other parts of South America within the tropics, and is a handsome tree with large rose coloured flowers. The seeds are covered by a thick soft pulp, and are frequently carried by birds and deposited upon the limbs or trunks of trees where they take root like the misletoe. The roots spread on the surface of the tree till they find a decayed hole or other lodgement where there is a small portion of soil; the fertility of this being exhausted, a root is discharged out of the hole, descending till it reaches the ground,

though at forty feet distance; here it again fixes itself, taking root, and becomes a much larger tree. The resin collected from this plant is used as an external application in veterinary medicine, and is also employed for covering boats instead of tallow and pitch. The fruit of *C. flava*, sometimes called wild mango, yields a yellow juice like gamboge.

Clusiaceæ or **Guttiferæ**. *The Gamboge family.*—A nat. ord. of dicotyledonous plants inhabiting the hotter parts of tropical countries in both the Old and New World. They are trees or shrubs with a succulent juicy fruit, in many cases resembling a large apple or orange, and they yield a resinous juice which is acrid, purgative, and has a yellow colour. The most important of these products is the *Gamboge* of commerce, so well known as a yellow pigment and a purgative medicine. The plant which produces this substance is not well known. There are two kinds of gamboge; one, called the Ceylon gamboge, is the produce of *Gambogia gutta*; the other, which is the only kind met with in commerce, called Siam gamboge, is not exactly known, but is supposed to be derived from the *same source*. The districts which yield this gamboge, lie on the east side of the Gulf of Siam between the latitudes of 10° and 12° N., comprising a portion of Siam and the kingdom of Camboja, which latter gives the substance its English name. It is obtained by making incisions in the bark of the tree, from which it exudes, and is collected in vessels placed to receive it, in which it soon assumes a firm consistence. The fruits of several of this family are much esteemed, such as the mangosteen, see GARCINIA; and the mammee apple or wild apricot of South America, a drupaceous fruit, which is the produce of *Mammea Americana*. This fruit is said to be delicious; its seeds are anthelmintic; its flowers yield on distillation a spirit known as Eau de Créole, and a wine is obtained by fermenting its sap. The large berries of the pacouryuva of Brazil, *Platonia insignis*, are highly prized on account of their flavour; and the blossoms of *Mesua ferrea* are remarkable for their fragrance, and are sold in the bazaars of India, strung together in a chaplet, under the name of nagkesur. The tacamahaca resin is the produce of another species, see CALOPHYLLUM; and a solid kind of oil of the consistence of butter is obtained from the fruit of *Pentadesma butyracea*, the butter and tallow tree of Sierra Leone. Some of the plants of this family are parasitic. See CLUSIA.

Clymene or **Climene**.—A genus of annelides belonging to the order *Chetopoda*, and forming the type of a small family, called by some naturalists *Maldaneæ*, and by others *Clymeneæ*. A few species only are known, all marine, without cirrhi, and the body divided into two distinct regions. These animals are less sedentary than the true tube-inhabiting annelides, but they do reside in an artificial tube made of small shells and fine grains of sand. Two or three species are European.

Clymenia.—A genus of fossil *Mollusca* belonging to the class *Cephalopoda* and family *Nautilidæ*. Forty-three species have been described from the Devonian. See NAUTILIDÆ.

Clypeaster.—A genus of echinodermatous animals belonging to the class *Ditremata*, order *Echinida*, and family *Scutellidæ*; or those which have the mouth sub-central and provided with teeth. Their shell is oval or elliptic, often swollen or gibbous, the edge thick and rounded, the inferior disc concave in the centre, and the spines very short. Several species are known, inhabiting the seas of warm countries, Asia and America. The fossil species are more numerous, chiefly from the tertiary strata.

Clythra.—A genus of tetramerous *Coleoptera* belonging to the family *Chrysomelidæ*. The beetles belonging to this genus have their antennæ in form of a saw, and in general are of a yellow-brown or blue colour, without metallic radiance. About twenty-eight species have been described, natives of Europe, Asia, and Africa. The perfect insects reside on trees and shrubs, and their larvæ inhabit a hairy coriaceous tube, which they drag about with them, protruding the head from the narrow end. They form this tube of their own excrement, which they mould to its proper shape by the assistance of their mandibles, and it augments in size as the larva itself grows. It is about five lines long, and one end is quite closed. The larva is four lines in length, and withdraws itself towards the middle of the case, where it remains curled up and quite quiet. When the creature commences its transformations, it closes up the other extremity also, and when it has arrived at its perfect state, it gnaws a hole through the opposite end, and make its escape.

Clytus (κλυτος, something which makes itself be heard).—A genus of tetramerous *Coleoptera* belonging to the *Longicornes* and family *Cerambycidæ*. Eighty-eight species of this genus have been described, of which two-thirds belong to Europe and America. They are moderate sized beetles of a velvety black, adorned with bands and spots of yellow and white. They are found in flowers and upon cut wood, and when pursued, run quickly, emitting at the same time a peculiar sound, produced by the rubbing of the pro-thorax against the abdomen, as the insect raises and lowers its head—hence the name of the genus. The larvæ live in the interior of trees. The typical species, and the most common, is *C. arietis*, about half an inch in length, and frequently met with in gardens and woods in the neighbourhood of London. The largest species is *C. speciosus*, a North American beetle, which is very destructive to the sugar maple, upon which tree it is generally found. It lays its eggs on the trunk of the tree in July and August; and as soon as the grubs are hatched they bur-

row into the bark, under which they are protected during the winter. In the spring, they penetrate deeper, and form in the course of summer, long and winding galleries in the wood up and down the trunk. The larvæ of *C. pictus* are equally injurious to the locust trees of America, boring into the trunk and forming winding and irregular passages in an upward direction from the place of their entrance.

Cnethocampa (*κνήθω*, to excite great itching; *κάμπη*, a caterpillar).—A genus of nocturnal *Lepidoptera* belonging to the family *Bombycidæ*. The typical species of this genus, and upon which it is founded, is the *C. processionea*. The larvæ of this species are covered with slight tufted hairs, which, when detached from the body, cause severe itching and irritation to the skin when they touch it. Even when the hairs of the cast-off case touch a person this irritation is produced. The nest in which these larvæ live is a foot long and half a foot broad. It is rounded at each end and attached to the trunks of oaks, sometimes near the ground, at others eight or ten feet high. These insects are called processionary moths, in consequence of the regular order in which their larvæ march when they move from one tree to another in search of food. This procession takes place after sunset. One caterpillar commences the march, a second follows, then a third, &c., for a line of two feet long. They then march two in front, and after several rows of two, they commence rows of three, then of four, five, and at last of ten, and even twenty. These rows are in very straight lines, one never exceeding another by even a single head. When the conductor stops, they all stop, and the whole procession follows faithfully the movements of the leader. They undergo their transformation in the nest, each however wrapt up in its own cocoon. Another species, *C. pityocampa*, suspends its nest from the branches of the pinus sylvestris. It is about the size of a man's head, in shape of an inverted cone; and the larvæ, which are also processionary like the last, leave the nest to undergo their changes and hide themselves under ground.

Cnicus.—A genus of plants belonging to the thistles. See CARDUUS.

Coal.—In ordinary language coal is spoken of as a mineral, but we now know that it is of vegetable origin, and is believed to be produced by the oxidation of vegetable matter, or by the influence of pressure and heat. The old coal beds appear to have been formed from deposits analogous to our peat bogs, and hence naturally consist in great part of vegetables whose remains soon become indistinguishable. Coal is divided into two kinds—1, coal without bitumen, as ANTHRACITE, and 2, coal with bitumen, of which there are many varieties. The quantity of coal consumed in Great Britain amounts to about 16,000,000 tons annually; the number of people directly employed in the various branches of the trade may be estimated at from 160,000 to 180,000; and the capital employed in the coal trade of Great Britain is calculated to be eight or ten millions! In 1854, 7,448,000 tons of coal were raised in Scotland alone, which at an average price of 7s. 6d. per ton, produced a sum of £2,418,000.

Coassus.—A genus of animals belonging to the deer tribe. See CERVINA.

Cobalt.—A hard, brittle metal of a steel-gray colour, and of specific gravity 8·5. It is very difficult to melt, and does not volatilize at any temperature. Cobalt is not found in the native state, but is met with forming various combinations with sulphur and arsenic. *Cobaltine* or bright white cobalt (sulpho-arsenide of cobalt), is an ore of cobalt in combination with arsenic and sulphur, and occurs in crystals of a silver-white colour inclining to red, in gneiss rocks in Sweden, Norway, Siberia, and Cornwall. *Smaltine* or radiated white cobalt (arsenide of cobalt), is an ore in combination with arsenic and a small proportion of iron, and is found in regular crystals in Saxony, Bohemia, Hesse, and Thuringia. *Koboldine* (sulphide of cobalt) is an ore in combination with sulphur, occurs in grayish-white kidney-formed masses, and is found at Bastnas in Sweden. Various other ores are found in different parts of the world, but they are of little use to man. It is the oxide of cobalt that is of the chief value and is principally employed. Melted with silica and potash it forms what is known in commerce as *Smalts*. This is a sort of glass of a beautiful deep blue colour, and when ground very fine is known by the name of powder blue. The colour of smalts is not affected by fire, and is consequently in great demand as a pigment for painting earthenware. It is also employed to colour starch blue, to form the light cobalt blue known as Thenard's blue, and to colour paper. Smalts is principally manufactured in Prussia, Saxony, and Norway, and the annual importation into Great Britain amounts to about 319,400 lbs.

Cobitis. *The Loach.*—A genus of malacopterygious fishes belonging to the family *Cyprinidæ*. The species are small, inhabit fresh water, and possess barbules on the upper lip. They feed at the bottom of the water, and are very restless during stormy weather, rising to the surface. *C. barbatula*, known as the beardie loach, is the most common species in this country.

Coca.—A stimulant narcotic plant. See ERYTHROXYLACEÆ.

Coccidæ. *Scale Insects or Mealy Bugs.*—A family of homopterous insects belonging to the section *Monomera*, characterized by having only one joint to the tarsi. The females of these insects are apterous, the males only being furnished with wings. The greater number of the female coccidæ live upon plants, and are found firmly attached to the stem or bark of the trees, &c., which they inhabit. In this state they lose all trace of

articulations of the body, become motionless and apparently senseless, resembling only the vegetable excrescences called galls. They even pair with the male without disengaging their beak from the plant in which it is fixed. They lay a large quantity of eggs, and secrete underneath them a cottony matter in greater or less abundance according to the species. After laying, the females soon die, and in many of the species the dead body of the parent forms a covering to the young. Some of them secrete this cottony substance in such quantity, that it covers the insect itself as well as its eggs. The larvæ as soon as they are born spread over the branches and leaves and remain during the warm weather. They are very small, but when they take possession of a plant or young tree, they increase to such an extent, that the death of the vegetable becomes almost certain. They are amongst the most hurtful of insects in gardens and hothouses, and often produce great mischief to fruit trees. In 1843, the orange trees of the Azores or Western Islands were nearly entirely destroyed by the *Coccus Hesperidum;* and in Fayal, an island which had usually exported 12,000 chests of oranges annually, not one was exported. We are indebted, however, to other species of this family for products of great commercial value. The celebrated scarlet dye known by the name of *Cochineal,* is derived from a species of coccus, *C. cacti,* which feeds upon the cactus plants, more especially upon the *Cactus cochenellifer.* The cochineal insect is originally a native of Mexico, though it has become naturalized in various other countries. The *Cacti* are called by the Mexicans *Nopals,* and the cultivation of these plants for the sake of the insects is called *Nopalerie.* The insect is about the size of a grain of barley, globular like a pea, and terminated posteriorly by two short setæ. The females have several generations in the year, and when they are collected they are detached from the plants by a blunt knife. They are then plunged in hot water for a few seconds, and afterwards exposed to the sun for a day, or a day and a-half, to become thoroughly dry. In this state they have the appearance of small rough berries or seeds of a grayish-purple colour, and were at one time indeed considered to be so. At first, Mexico alone produced this insect, and it formed one of the most productive sources of the riches of that country. When Humboldt visited it, he ascertained that 880,000 lbs. weight of insects were annually exported, each lb. containing about 70,000 insects, and producing an annual revenue of 7,410,000 florins (Dutch). The annual consumption in England is about 150,000 lbs., worth about £375,000 sterling. At the end of the eighteenth and beginning of the nineteenth century, the cochineal insects were imported into St. Domingo, and they have since been introduced into other West India Islands; they have also been imported into India, Algiers, Spain, and the Canary Islands. Another species, *C. sylvestris,* is also used in Mexico, but it is totally covered with cottony matter, whilst the *C. cacti* is only partially so, and is therefore much more esteemed. The latter is known in commerce as the *grana fina* or fine grain, and the former, as the *grana sylvestra* or wild grain. *C. Polonicus* is a native of Poland, living upon the *Scleranthus perennis,* and was formerly of great value to that country. It is known by the name of the scarlet grain of Poland, and though it is still used in Poland and Russia as a dye, the introduction of the Mexican species has superseded it and reduced its value. The Turks use it for dyeing wool, and for staining the nails of women's fingers. The Greeks and Romans possessed a dye which the former called *κοκκος,* the latter *Coccum* or *Coccus baphica,* and which was derived from the species known to naturalists by the name of *Coccus ilicis,* found upon the *Ilex coccifera,* a low bushy shrub growing in the south of Europe and the Levant. It is the kermes of the Arabs, the alkermes of the Persians. Besides these valuable dyes, another product is derived from an insect of this family. This is the substance called lac or gum lac, and is produced by the *Coccus lacca,* a native of India. The insect deposits its eggs on the bihar tree, *Croton lacciferum,* the pepel, *Butea frondosa,* and other trees, and these are covered by this peculiar substance, which serves as a nidus and protection to the ovum and insect in its first stage, and as food for it when it becomes more advanced. Lac yields a fine red dye, which, though not so bright as the true Mexican cochineal, is said to be more permanent; and the resinous part is extensively used in the manufacture of sealing wax, making waterproof hats, and as a varnish. In its natural state, encrusting leaves and twigs, it is called *stick lac. Lac dye, Lac lake,* or *Cake lac,* is the colouring matter extracted from the stick lac. When the stick lac is separated, pounded, and the greater part of the colouring matter extracted by water, it is called *seed lac.* When melted down into cakes, it is *lump lac,* and used by the natives for making bangles, or ornaments in the form of rings for the arms of the lower class of females. When melted, strained through cotton bags, and formed into thin laminæ or plates, it forms *shell lac,* and it is this kind that is so much used in the useful arts. It is now extensively employed in the manufacture of hats; and the quantity retained for consumption in 1851, amounted to 11,869 cwt. In 1853, 1,200,000 lbs. of lac dye were imported into this country; while the importation of *stick lac* amounted to 319,373 lbs. The vegetable wax of China is the produce of several species of coccus, as *C. sinensis,* &c., and a similar product has lately been discovered to be produced by the *Flata limbata* in India.

Coccinellidæ.—A family of trimerous *Coleoptera,* containing upwards of 500 species distributed through twenty-two genera. They are distinguished by the hemispherical and convex

form of the body, the second joint of the tarsi being large and deeply bilobed, and by the colour and spots on their elytra. Species of this family are found in all parts of the world, and one, *Coccinella septem-punctata*, is found in Europe, Asia, Africa, and America. Some live and feed upon plants, but the greater number are carnivorous, and devour the larvæ of insects, and are particularly destructive to the aphides or plant lice. The genus *Coccinella* is the type, and comprises insects with which every one is familiar. The lady birds or lady cows are the especial favourites of children in this country, and in France they are known by names equally familiar, as "Vaches à Dieu, Bêtes de la Vierge, Volemidi," &c. They are small insects, generally red or yellow, with black spots varying in number and size; or black, with white, red, or yellow spots. They creep rather slowly, but fly rapidly, especially when the temperature is high. When alarmed, or laid hold of, they fold up their legs and eject from the joints of their limbs, a yellow mucilaginous fluid of a strong and disagreeable odour. They are very abundant in gardens and plantations, upon plants which are infested with aphides. Both in their perfect and larva state, they are very serviceable in destroying these troublesome insects. The female lays her eggs in small yellow patches in the midst of the plant lice, so that the larvæ when hatched are in the midst of their food. Upwards of 120 species of *Coccinellæ* are described, several of which are natives of England. Immense swarms of these creatures are sometimes observed, especially on the south-eastern coast. They have been described as extending in dense masses for miles, and consisting of several species intermixed. The *Coccinella septem-punctata* is the most common species, and the circulation is well exhibited through the microscope in its elytra. If one of these is separated from the body without being detached, and arranged in such a manner that it may be viewed as a transparent object, slow and uniform continuous currents, one ascending and the other descending, will be seen between the plates of which the elytron consists.

Coccolobus (κοκκος, a berry; λοβος, a pod). —A genus of dicotyledonous plants belonging to the nat. ord. *Polygonaceæ*, sub-order *Polygoneæ*, containing a number of species, several of which are cultivated in Europe. They are evergreen trees, all natives of the West Indies and tropical America, and some of them are very ornamental, having large leaves and flowers in clusters. *C. pubescens* is more than twenty-five feet high, with orbicular leaves measuring from six to eight inches in diameter, and very wrinkled and reticulated. The wood is very hard, almost incorruptible, and much used in building. *C. uvifera*, or *sea side grape*, is a tree about twenty feet in height, with beautiful leaves of a full bright glossy green colour, and the principal nerves of a deep red. The fruit is in bunches of the size and colour of cherries, has an acidulous taste, and is eaten in the West Indies. The wood yields a red colouring matter, which is used as a dye, and along with the leaves and bark is very astringent. A decoction of them is evaporated to form the substance known as Jamaica kino. The wood of this species is hard, and used for cabinet work.

Coccosteus.—A genus of fossil fishes with a tuberculated scaly covering, from the old red sandstone of Cromarty, Caithness, and the Orkney Islands.

Coccothraustes.—See COCCOTHRAUSTINÆ.

Coccothraustinæ.—A sub-family of birds belonging to the conirostral tribe of the order *Passeres*, and family *Fringillidæ*. The birds belonging to this sub-family are altogether graniferous, and feed their young with seeds which they bruise and disgorge from their crop, instead of insects and larvæ, as the other fringillidæ do. The genus *Coccothraustes* is the type of the family, and is characterized by having the beak conical, very thick at the base, tapering rapidly to the point, and so strong that they are able to break the stones of cherries and other fruit with the greatest facility. The wings are long and rather powerful, and the tail short and more or less forked. The hawfinch, or grosbeak, *C. vulgaris*, is common in many parts of Europe, and has lately been ascertained to breed in this country, in Essex and Kent, though it is generally considered to be migratory. It is of a reddish-brown colour, marked with black, gray, and white, is of shy, retiring habits, living in secluded places in woods and forests, and feeds upon hard seeds, kernels, and more especially the berries of the hawthorn, from whence it derives its name.

Cocculus.—A genus of dicotyledonous plants belonging to the nat. ord. *Menispermaceæ*, and containing many species (upwards of sixty-five having been described), growing in all the intertropical regions of the world. They are climbing shrubs with heart-shaped leaves, and small flowers in loose panicles or racemes. Several species, natives of Brazil and India, are considered by the natives as specifics in cases of intermittent fevers, and from the bitter principle which they contain they are useful as stomachics. The most important species to Europeans is *C. palmatus*, that which produces the excellent medicine known as calumba or colomba, and which is so much employed as a tonic bitter. The part used is the root, which is large, fleshy, of a deep yellow colour, and divided into many irregular forks, which are cut off by the collectors, sliced, strung on cords, and hung to dry in the shade. This plant is a native of the forests which border the Mozambique, and is now cultivated in the Mauritius and the Isle of Bourbon. The forests of Malabar produce a plant, the seeds of which are well known in Europe as the *Cocculus indicus berries*, which contain a powerful bitter

poisonous principle called *Picrotoxin*, and to which they owe their dangerous qualities. They are not used internally in medicine, but have been employed externally in some cutaneous affections. Cocculus indicus is a well known poison for destroying fish, and has been extensively used by brewers as a substitute for hops—an adulteration which is prohibited in Britain by severe statutes. The plant has been described as a species of cocculus, *C. suberosus*, but later botanists have separated it from this genus, and formed of it a new one called *Anamirta*.

Coccus.—See COCCIDÆ.

Coccyx.—A genus of nocturnal *Lepidoptera*, inhabiting the forests of resinous trees in Europe, to which the caterpillars are often very destructive. They feed upon the buds and young shoots of the pines, causing excrescences which deform and injure their growth if they do not kill them entirely. Three species occur in the forests of Germany, where they are said to do much damage.

Coccyzinæ.—A sub-family of cuckoos. See CUCULIDÆ.

Cochlearia.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ* and sub-order *Pleurorhizeæ*. The species are herbaceous, usually smooth and fleshy, and mostly inhabitants of northern climates. The common scurvy-grass, *C. officinalis*, is one of the most common, and is considered one of the best antiscorbutics we possess. It is a powerful stimulant, and has a warm acrid bitter taste. The scurvy-grass is a native of the sea shores of different parts of Europe, and, according to Forster, occurs in the islands of the South Sea. *C. Danica* and *Anglica* are also antiscorbutics, and, along with the preceding, are natives of Great Britain as well as the northern parts of Europe. The horse radish, so well known as a poignant condiment to various kinds of animal food, especially roast beef, and as a warm pickle, is generally described as a species of this genus also, though latterly botanists have removed it to another. It is the *C. Armoracia* of the earlier authors, and the *Armoracia rusticana* of the later. The root is large and fleshy, spindle-shaped, and is the part used. Applied externally, it readily inflames the skin, and if its application be long continued, produces blisters. An infusion of it in cold milk is said to be one of the safest and best cosmetics. The horse radish is a native of several parts of Europe, and is now naturalized in England.

Cocoon.—A name generally applied to the silky case, usually of an oval form, which the caterpillars of many lepidopterous insects spin, and in which they undergo their transformations, such, for example, as that made by the silkworm. The ant lion, *Myrmeleon formicaleo*, is almost the only insect belonging to the other orders, the larva of which spins a cocoon in which to remain till it changes to a chrysalis. Many spiders spin cocoons, but these are only destined to contain their eggs.

Cocos.—A genus of palm trees, containing upwards of fourteen species, all, with the exception of one, natives of tropical America, especially Brazil. They are almost all large trees with a straight stem, marked with annular cicatrices, and surmounted with a crown of large pinnated leaves, the leaflets numerous, often narrow, pendent, and flexuous. The most important species of the genus is the common cocoa nut tree, *Cocos nucifera*, spread over all the tropical regions of both continents, and one of the most valuable trees in the world. Its real origin is doubtful, some considering its native country to be Asia, others America. The cocoa nut tree rises like a slender column to from sixty to ninety feet in height, and is crowned by twelve or fifteen pinnated leaves about thirteen feet long, drooping like gigantic ostrich feathers, and giving the air of a tuft of vegetable plumes. It is chiefly confined in its growth to the borders of the sea, where the soil is impregnated with salt water, and its fruit is capable of being carried to any distance by the waves and currents, and, when thrown upon shore, of taking root and flourishing. The uses to which the cocoa nut tree is applicable in its native country are numerous. The ripe fruit is a wholesome food, and the milk it contains is a grateful cooling beverage, and these form the principal sustenance of the poorer Indians in many districts. The fruit is a nut with a very hard shell and a white kernel, tasting like the hazel nut, and is enclosed within an outer husk about the size of a man's head. The shell itself is polished, and formed into goblets, boxes, and cups; and in India it is universally used by the natives as the bowl of their *hubble-bubbles*, or smoking pipes. The outer husk is of a fibrous consistence, and this, after being soaked in water, is beaten into a kind of oakum, spun into yarn called *Coir*, and manufactured into cordage considered superior to that made from hemp, and woven into sailcloth, fishing nets, &c. Coir has now become a considerable article of commerce, and about 3,000,000 lbs. weight are annually exported from Ceylon to Calcutta and other parts of India; and in 1851, 10,661 tons of this yarn were brought to Liverpool alone. The kernels pressed in a mill yield an excellent oil called cocoa nut oil, which is extensively used in India, and largely employed in Europe for burning, in the manufacture of torches, and in the composition of pharmaceutical preparations. Mixed with *dammer*, a kind of resin, it forms the substance used in India for paying the seams of boats and ships. A tree generally yields from eighty to one hundred nuts annually. The trunks of the trees are used for making boats, frames of houses, rafters, posts, and gutters to convey water, &c.; the leaves are used for thatching houses, and are wrought into mats, baskets, lanterns, articles of head-dress, and paper to write upon. The young

leaves, before they are expanded, form a delicate vegetable, and the old ones, when burned, yield potash in abundance. If the ends of the young spathes be cut off, or the body of the tree be punctured, there exudes a white sweet liquor which is collected by the natives in pots properly tied for the purpose. When collected early in the morning it is called toddy, and forms a delicious refreshing beverage. If allowed to stand for some time after sunrise it ferments, and is then called palm wine, and by distillation an ardent spirit is obtained, called arrack, which is more esteemed than that procured from rice. By further distillation a sugar is obtained used by confectioners; and this, mixed with lime, forms a powerful cement, which resists moisture, endures great solar heat, and will take a fine polish. The juice of the pindova, or *Cocos butyracea*, abounds in sugar and furnishes by fermentation a sweet wine much sought after by the inhabitants of Brazil, of which country it is a native. Its kernels bruised and pressed, furnish a substance of the consistence of butter, which is very abundant, and of an agreeable taste.

Coelacanthus.—A genus of fossil fishes occurring in the coal formation and magnesian limestone in the north of England.

Coelogenys (κοιλος, hollow; γενυς, cheek).—A genus of rodent animals belonging to the family *Histricidæ*, sub-family *Dasyproctina*. It contains only one species, and derives its generic name from its having, in addition to true cheek pouches, large pouches under the zygomatic arch opening on the side of the cheek. The *C. Paca* is one of the largest of all the South American rodents, and was described by the early voyagers under the native name of *Paca*. It is a thick-set stubby animal, with clumsy legs, short neck, heavy head, and rounded body. The tail is reduced to a tubercle, its gait is heavy, but its movements are prompt and sudden. The colour of the fur is blackish-brown, with four rows of parallel white spots along the sides. It inhabits low humid forests in the neighbourhood of water, digging a burrow like the rabbit, but much shallower. Though heavy and corpulent, it can run with a good deal of activity, often takes lively jumps, and swims and dives with great adroitness. It is a nocturnal animal, feeds upon fruits and tender plants, is very cleanly in its habits, and its flesh is said to be excellent eating and of good flavour. A fossil species is found in the caverns of Brazil.

Coenobita.—A genus of hermit crabs. See CRUSTACEA.

Coenurus (κοινος, common; ουρα, tail).—A genus of intestinal worms, or *Entozoa*, belonging to the order *Cestoidea*, and family *Cysticidæ*. It consists of a simple cyst filled with an albuminous liquid, upon the outer surface of which a number of soft, short, retractile, cylindrical and rugose, rather than jointed bodies, are situated. They are very small, and when examined by the microscope are found to possess a head like that of a *Tænia*, or tape-worm, armed with four discs and a crown of hooks. The species best known is the *C. cerebralis*, inhabiting the brain of the sheep, and producing that fatal disease known by the name of *sturdy* or *staggers*. The vesicle itself is as large as a hen's egg and each individual is from 1·5″ to 1·6″ in length, appearing to the naked eye as mere white opaque specks. Recent researches have discovered that this so-called genus is only the immature form of a tape-worm. The vesicle with its contents, after being extracted from the brain of the sheep, has been given to a dog, and upon the dog being killed these little creatures have been found to have assumed the form of a *Tænia*. The inverse experiment has succeeded as well. A healthy lamb has been made to swallow detached joints of these *Tæniæ* which contained eggs, and about fifteen days afterwards the young sheep was attacked with sturdy, and upon being killed a number of vesicles containing *Cœnuri* were found in the brain.

Cœrebinæ.—A sub-family of birds. See NECTARINIDÆ.

Coffea. *Coffee.*—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ* or *Cinchonaceæ*, containing many species of berry-bearing shrubs, all natives of tropical countries. That which yields the coffee of commerce, *C. arabica*, is the best known and most useful. It is a pretty evergreen shrub, varying from fifteen to twenty feet high in its native country. The flowers are white with a rosy tint, and have an odour of the jasmine. The fruit is a succulent berry about the size of a cherry, and contains two seeds, which are of a hard consistence, and are known as the coffee beans. The coffee tree is originally a native of Upper Ethiopia, where it was known from time immemorial, and is still cultivated with success. It is said that a Mollah named Chadely was the first Arab who used coffee, and this with the object of keeping himself awake for his nocturnal orisons. The dervishes imitated him, and it then passed from the borders of the Red Sea to Medina and Mecca, and by means of the pilgrims to all parts of Mohammedan countries. The best coffee comes from Yemen, and particularly from Mocha, where the Arabs know it by the name of *Kahouch*, whence the French *Café*, and the English *Coffee*. Coffee was first introduced into Europe at Venice, about the year 1615. It got to Marseilles in 1654, and was brought to Paris direct from the East by Thevenot in 1667. An Armenian of the name of Pasque or Paskal opened the first public Café at Paris in 1669. He did not succeed, however, but was obliged to go to London, where he opened a coffee-house in George Yard, Lombard Street, and prospered so much that in a short time, in 1688, there were, it is said, as many coffee-houses in London as in Cairo. Raw coffee has little or no taste or smell, and it is only

by roasting it that we obtain its aroma and peculiar flavour. This depends upon the presence of a bitter principle contained in it, called *Caféine*, and what is very curious, is identical with the peculiar principle found in tea. The introduction of tea and coffee has led to the most wonderful change that ever took place in the diet of modern civilized nations. These beverages have the admirable advantage of affording stimulus without producing intoxication or any of its evil consequences. The consumption of coffee in England has increased amazingly of late years. In 1836 the consumption in Great Britain was 10,500 tons. In 1847, 19,783 tons were imported; in 1848, it had risen to 24,553 tons; and in 1850, 50,803,152 lbs. were imported, of which 31,166,358 lbs. were retained for consumption, raising an amount for duty of £565,659. In 1851, it was calculated that the quantity of coffee exported from Arabia, East and West Indies, South America, and other countries producing it, amounted to 251,000 tons, of which there was consumed in the different countries to which it was imported 232,500 tons.

Coix. *Job's Tears.*—A genus of grasses containing one species, *C. lacryma.* The seeds are very hard, smooth, of a pearly gray lustre, are known by the name of Job's tears, and are used as beads to form bracelets and necklaces. They are said by some writers to possess tonic diuretic powers.

Colaspis.—A genus of beetles. See CHRYSOMELIDÆ.

Colchicæ.—A sub-order of monocotyledonous plants belonging to the nat. ord. *Melanthaceæ.* This group contains several species which are stemless, the flowers springing from an underground rhizome. The genus *Colchicum* contains upwards of twenty species, many of which are cultivated in our gardens. They are chiefly natives of the temperate parts of Europe and Northern Asia, and have long tubular flowers, and linear leaves which succeed the flowers. The most common species is the meadow saffron or autumnal crocus, *C. autumnale*, which is a native of England and many other parts of Europe. It is a showy plant, and in some countries, the moist meadows in the beginning of autumn often appear as if enammelled with its fine purple flowers. The whole plant exhales a strong and nauseous smell, and possesses powerful narcotic poisonous qualities, which depend upon the presence of a peculiar alkaloid called *Colchicine.* The taste is at first sweetish and insipid, but it soon becomes hot, acrid, and irritating; the palate, throat, and tongue experience a burning sensation, and then succeed spasms, cold sweats, pains in the region of the heart, vomiting, and at last death, if proper remedies be not immediately administered. The cormes, or roots, are much used in medicine in cases of gout, rheumatism, &c., and an infusion of the leaves in boiling water, applied as a lotion, has been used in France to destroy the lice which infest horned cattle.

Coleoptera (κολεος, a sheath; πτερον, a wing). *The Beetles.*—A name given to that order of insects known as beetles, and which have four wings, the superior pair of which are hard and coriaceous, and serve as sheaths or coverings to the inferior pair, which are membranous and folded transversely under the others when the insects are in a state of repose. The hard coriaceous pair are called *Elytra*, and when at rest are joined to each other at their inner margins, forming on the back of the beetle a median line called a suture. They open at right angles with the body, and do not beat the air when the insect is flying, but remain fixedly open. The difference between the males and females is in general well marked, depending in some genera upon the structure of the antennæ, in others on the feet, &c. The act of pairing only takes place once in their lifetime. The male immediately after that time dies, and the female undergoes the same fate as soon as she has laid her eggs. The places where these are deposited are various, according to the various tribes; some in water, at the bottom of pools, &c.; others on plants; some in the substance of wood bored by the female; and others again in putrid animal matter, or in the ground &c., &c. The larvæ are generally in the form of soft worms, with twelve rings to the body independent of the head, and six feet. They take different lengths of time to arrive at maturity; some which live on leaves obtaining their perfect form in the course of about a month or six weeks, while others which live on roots, or in the interior of trees, do not arrive at maturity for two or three years. Some enclose themselves, when preparing for the pupa state, in a kind of cocoon or web; those which live in the ground merely remove the earth so as to form an open oval space; and those which live in wood for the most part assume the pupa state without any preparation. Many of the larvæ of the *Coleoptera* are exceedingly destructive to vegetation, and even some of the perfect beetles themselves do much mischief to agriculture. Beetles are scattered everywhere; some live in the water, but by far the greater number are terrestrial, and their habits vary very much in the different families. It is remarkable, however, that not one species is found that is venomous, or that is armed with a sting like some of the *Hymenoptera.* None of them are employed in the industrial arts, and only the *Cantharides* furnish remedies useful in medicine. The larva of one species, *Cerambyx heros*, was considered by the Romans as a great delicacy, and the American Indians look with the same regard upon that of another, the *Calandra palmarum.* The species of coleopterous insects already known are between thirty and forty thousand, and the number is increasing every day. Their arrangement, therefore, is one of some importance, and various

methods have been proposed and adopted. The one most generally used is that which is based upon the number of joints of the tarsi. In this, the great divisions are four:—1. *Pentámera*, in which all the tarsi are five jointed, the fourth being of ordinary size. 2. *Heteromera*, in which the four anterior tarsi are five jointed, and the two posterior four jointed. 3. *Pseudotetramera*, in which the tarsi are four jointed, the third joint being very diminutive and concealed between the lobes of the preceding. 4. *Pseudotrimera*, in which the tarsi are four jointed, the third joint being very diminutive and concealed between the lobes of the preceding.

Colops.—A genus of *Infusoria*, made the type of a particular group called symmetrical infusoria. The species are very voracious, and feed upon dead *Entomostraca*, &c.

Colias.—A genus of diurnal lepidopterous insects belonging to the family *Papilionidæ*, containing a number of species, found feeding upon papilionaceous plants, such as Lucerne, &c., and on grasses. Two or three species are found in England, and are amongst the most elegant of our British butterflies.

Colius.—A genus of birds belonging to the conirostral tribe, of the order *Passeres*, and family *Colidæ*. The species belonging to this, the only genus of the family, have a short, thick, strong beak, short robust tarsi strongly scutulate, and short wings. They possess fine silky plumage, and their head is adorned with a hoop of feathers. They are all African birds, and are found spread from Senegal to the Cape of Good Hope and Abyssinia. These birds live in society, and creep along the branches of trees head downwards. Their cry is monotonous and mournful. Their food consists of fruits and the buds and young shoots of trees, and they build their nests in common upon the same bush, five or six, or even more, being often united together, each containing three or four rosy or brownish eggs. They sleep clinging to the branches with their heads hanging downwards, and pressed close against each other. The natives of the countries where they are found eat them, and consider them great delicacies.

Colletes.—A genus of insects belonging to the order *Hymenoptera*, and family *Andrenidæ*. The bees belonging to this genus make their nests in the earth and the softer parts of walls. Each nest is cylindrical, consisting of from two to four cells placed end to end, shaped like a thimble, the bottom of one fitting into the mouth of that beneath it. Each cell contains an egg and a quantity of pollen paste, destined for the food of the larva when hatched.

Colobus.—A genus of monkeys. See CERCOPITHECINA.

Colocasia.—A genus of plants. See ARACEÆ.

Colophonite.—A species of garnet, called yellow garnet, or topazolite. It is coarse and granular, of various shades of yellow, composed chiefly of silica and protoxide of iron, and is found in Norway, Piedmont, Ceylon, &c.

Colossochelys.—A fossil genus of tortoises. See CHELONIA.

Coluber.—See COLUBRIDÆ.

Colubridæ.—A family of reptiles belonging to the order *Ophidia*, and sub-order *Colubrinæ*, or harmless snakes. They are characterized by having their belly covered with broad, band-like shields, or cross plates, by their vent having no spur-like feet, by their tail being conical and tapering, and by their having no poison fangs. This family contains more than half of the species of snakes; some remarkable for the splendour of their colours, and others for the regularity of their distribution. Many are quite uniform in their tints, some are singularly slender in form, and a few only attain a large size. Their geographical distribution is very wide, species being found in many parts of Europe, in Asia, Africa, and America. One is a native of England, and is well known as the common or ringed snake, *Coluber natrix*, a very inoffensive and timid animal, about three feet in length, but often destroyed by mistake for the viper, from which, however, it may be easily distinguished by the black zig-zag line that runs down the back, and the lighter colour of the scales of the belly. It may be easily tamed, and we have seen one kept and made the pet of a young lady, coiling round her arms and neck, and nestling in her bosom. Its food consists of young birds, mice, and other small quadrupeds, and more especially frogs. The Esculapian snake, *Coluber Esculapii*, is the species seen represented by the ancients on the statues of Esculapius, and is a native of most of the warm parts of Europe, being particularly frequent in the neighbourhood of Rome. It is about four feet in length. A superb species is found in Java, the *Coluber Javanicus*, growing to the length of nine feet, and living in the rice fields of that country. It lives upon rats, small birds, &c. A genus occurs in India called *Naja*, or the spectacle snake, the species of which form exceptions to the general innocuous character of the family, as the Cobra de Capello, *Naja tripudians*, and one or two others, are very venomous. See NAJA. The species of another genus, *Dendrophis*, live the greater part of their life on trees, and are thence called tree snakes. Some of the colubridæ live in the Indian seas, and have the tail flattened like the sea snakes, such as the flat-tailed coral snake, or *Platurus*. Others, though they live on the ground, frequent exclusively the borders of streams, and when disturbed take refuge in them, and conceal themselves at the bottom.

Columba.—See COLUMBIDÆ.

Columbella.—A genus of gasteropodous mollusca belonging to the family *Buccinidæ*, containing about two hundred species of small prettily marked marine shells, living in shallow

water, on sandy flats, or congregating about stones, and feeding upon vegetables.

Columbidæ. *The Pigeons.*—A family of birds belonging to the order *Columbæ*, characterized by the species having feet with three divided toes in front and one behind, a moderate compressed bill covered at the base of the upper mandible with a soft tumid membrane in which the nostrils are pierced, and a tail like that of the perching birds. Pigeons pair in the season of love, the male and female working jointly at the nest, taking their turns during incubation, and participating in the care of the young. These, among the true pigeons, are hatched blind, fed in the nest, which they do not quit till they are covered with feathers, and are supported by their parents some time after their departure from it, having no power to feed themselves. They are monogamous, incubate frequently during the year, and lay only two eggs each time, building their nests in trees or rocks. Their power of rapid and long-continued flight has attracted the attention of all ages, and repeated allusions to this occur in the sacred writings and the works of the ancient poets. Their distribution is very extensive, though they are most abundant in Southern Asia and the Indian Archipelago; and they feed upon grain, fruits, and berries. This family may be divided into three groups or sub-families —*Treroninæ*, or tree pigeons; *Columbinæ*, the true pigeons; and *Gourinæ*, the ground doves. Of the first sub-family, the species are mostly arboreal, and have their feet formed expressly for grasping and perching, those of the genus *Treron* closely resembling in form the feet of the woodpecker or other scansorial birds. They are found in Asia, Africa, and Australia, where they reside in woods, feeding on fruits and berries. Their bill is short, convex above, and hooked at the tip. The *Columbinæ* have the bill rather long and slender, compressed and slightly hooked at the tip. The species of this sub-family are numerous, and are inhabitants of most parts of the world. Their feet are formed both for walking and climbing, and they feed upon grains or seeds. The genus *Columba* contains several well known species. The cushat or ring-dove, *C. Palumbus*, is the largest of our British pigeons, and builds its nest in the boughs of trees. The stock-dove, or wood-pigeon, *C. Œnas*, lives in hollow places in decayed trees, in Great Britain, and was at one time believed to be the parent or stock of our domesticated pigeons—hence the name. The real parent, however, is now considered by ornithologists to be the rock pigeon, *C. livia*, and from it are derived not only the common pigeon or inhabitant of the dovecot, but all those numerous varieties of domesticated pigeons so highly prized, and fostered with such care and attention by the amateur breeder or pigeon fancier. These varieties, numerous as they are, all originate from a few accidental varieties of the common pigeon, and not from any cross of that bird with other species. In the wild state the rock pigeon lives and breeds in holes of rocks in this country, migrating towards the south in winter. They are domesticated in great numbers in most parts of Europe, but Egypt and Persia seem the countries where they are most numerous. At Ispahan, in the latter country, there are reckoned at least three thousand pigeon houses. The young pigeons are called squabs, and are fed by the parent birds at first on a substance similar to curdled milk, which is secreted by the crop. The coats of this organ during the time of incubation undergo a remarkable change, becoming gradually enlarged and thickened, like what happens to the udder of females of the class *Mammalia*, and the secretion has the appearance of a milky fluid which easily curdles. The old joke, therefore, of sending out people on the 1st of April, on a fool's errand for "pigeons' milk," is based on fact. The domestic pigeons breed every month, and their fecundity is immense. Calculating two pigeons to hatch nine times a-year, in four years they would be the progenitors of 14,760 young. The names alone of all the varieties of pigeons would fill a page, and many are only interesting to the pigeon fancier. One, however, is well known, and was at one time highly valued. This is the carrier pigeon, which is immortalized by Anacreon, and other poets, as the bearer of love epistles, and by historians as the messenger sent by beleaguered hosts to friends at a distance. Of late years, in this country, and on the continent, the carrier pigeon was employed by those engaged on the race course, or in the prize ring, and in many stock-jobbing transactions. At the present day, however, their "ocupation's gone," the electric wire has nearly superseded them. The nutmeg pigeon,

Carpophaga ænea—Nutmeg Pigeon.

Carpophaga ænea, is a fine large species of this sub-family, living in the forests of India, the Moluccas, Celebes, Australia, and the islands of the Pacific, and feeding upon fruits and berries.

The nutmeg, or rather the soft covering of the nut called the mace, is their favourite food, and at certain seasons they luxuriate on this dainty fare, so much as to become loaded with fat, and when shot, to burst asunder when falling to the ground. The turtle-dove, *Turtur auritus* (*Columba turtur*), is another species of the *Columbinæ*, which is almost universally regarded with affection, and considered the most perfect emblem of connubial attachment. It is a migratory species, arriving in this country late in spring, and departing about the latter end of August. During this time they pair, breed, and rear their young, building their nests on the highest trees in the thickest and most sheltered parts of the woods. The turtle dove of the Scriptures is most probably a closely allied species, *Turtur risorius*, which is still plentiful in Egypt and other Eastern countries, and derives its specific name from a fancied resemblance to the human laugh in its coolings. It is so abundant at Constantinople, that it is said the Turkish government allows a certain rate of per centage in the duty on corn, on account of the turtles which alight in such numbers on the corn vessels crossing the port, uncovered, to the granaries and mills. The passenger pigeon of North America, *Ectopistes migratorius*, is another species which deserves notice. It is a native of the North American continent, between the 20th and 62d degree of north latitude, roosting in woods, and in many parts of the country appearing in vast numbers, and occupying a large extent of forest. Some of their breeding places are said to stretch through the woods several miles in breadth, and upwards of forty in extent, and single trees contain 100 nests at a time. They are migratory birds, and Wilson the American ornithologist, relates having witnessed one of their migrations, when he observed an immense mass passing over his head at a great height, for several hours' continuance. He calculated that the body would contain 2,230,272,000 pigeons, and calculating each pigeon to consume half a pint of food daily, they would devour 17,424,000 bushels daily. The third sub-family contains the ground doves, but for these see GOURINÆ.

Colutea. *Bladder Senna.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-family *Papilionaceæ*. There are several species, natives of the south of Europe, Palestine, and the Himalayas, and possessing yellow or yellow and red flowers of some beauty. The most common species is *C. arborescens*, a shrub twelve or fourteen feet high, with pinnate leaves, and large, membranous, transparent, inflated pods which look like vegetable bladders, hence the name of bladder senna. It is a native of the warmer parts of Europe, and is found growing on the ascent to the crater of Vesuvius, where scarce any other plants grow. Both leaves and pods are purgative, and may be substituted, but in large doses, for the officinal senna.

Colymbidæ.—A family of natatorial birds, belonging to the order *Anseres*, and containing the divers and grebes. They have very moderately feathered short wings, and legs placed so far back on the body as to make the birds assume an erect position. The bill is compressed at the tip, smooth, straight, and pointed. Some of the birds of this family suspend their nests on rushes at the surface of the water. The *Colymbidæ*, or divers, have large feet, with the outer toe longer than the middle one, and all the front ones entirely webbed. They are found in the northern regions, visiting the lakes of the interior during their breeding season. They are rapid divers, feeding on fish and sometimes vegetables. Only one genus is referred to this subfamily, the genus *Colymbus*, containing species which are found in the arctic seas of both the Old and New Worlds. The great northern diver, *C. glacialis*, is a large bird, measuring thirty-six inches in length, with an extent of wing of forty-eight. It does not arrive at its perfect state of plumage till it is three years old. It lives chiefly on fish, and abounds in all the interior lakes in Norway, Sweden, and Russia, where it destroys large quantities of them. It is rarely seen on land, but swims very swiftly, and for a long distance under water. It has a loud and melancholy cry like the howl of a wolf, or at times like the distant scream of a man in distress. It occasionally, though rarely, visits our coasts. The skins of the black throated diver, *C. arcticus*, which inhabits all the arctic regions, are dressed and made into caps, hoods, &c., and are much esteemed as a covering for the head and breast in the rigorous climates in which these birds are found. The *Podicipinæ*, or grebes, have the toes flattened, separate, and broadly fringed on the sides by a membrane, and their outer larger than their middle one. The species are found in most parts of the world, on the lakes, rivers, and fens of the interior, though some during the winter seek the ocean. They feed on small fish, crabs, insects, &c., and are said to carry their young under their wings when alarmed. Their nests are generally placed among reeds, and rise and fall with the water. They are excellent swimmers, and dive frequently. The type of the genus *Podiceps* is *P. cristatus*, the great crested or tippet grebe, a bird about the size of a goose, and a native of England, being found common in the fens of Shropshire, Cheshire, and Lincolnshire, where they are called gannts. It is a very careful nurse, feeding its young with small eels, and, when they are tired, carrying them on its back. This grebe is mostly valued for the plumage of its breast, for the flesh is rank and nauseous. Five species are found indigenous to Great Britain.

Colymbus.—See COLYMBIDÆ.

Colza.—A plant; a variety of the *Brassica campestris* (*B. campestris oleifera*). It is much cultivated in France and Holland, &c., for the

sake of the oil which is obtained from the seeds, called colza oil, and which is now much used for burning in lamps and for making soap.

Comatula. *The Feather Star.*—A genus of echinodermatous animals belonging to the class *Crinoidea*. The body is orbicular, depressed, and very small compared with that of the other genera of *Echinodermata*. It is protected above by an assemblage of calcareous pieces, and provided with five great rays, deeply bifid and pinnated, and one or two rows of short, accessory, articulated, simple rays, by means of which the animal attaches itself to foreign bodies. Throughout the whole length of the axis and pinnules of the great rays, the buccal or labial channel is continued, and this is fleshy and provided with cirrhi, which serve the animal to seize its prey. They are developed on the pinnules of the rays in a cavity which expands gradually. The young are furnished with a pedicel like the extinct *Encrinites*, and have been described as a different genus, under the name of *Pentacrinus*. Several species are enumerated, amongst which the rosy feather star, *C. rosea*, a pretty species, of a deep rose colour, is a native of Great Britain. Another species, a native of the West Indies and North America, is called the *Basket fish*, by the fishermen, who, on the shoals off Nantucket Island, frequently bring it up attached to their hooks. The five great rays are each divided into two branches; these are again divided into two each, and so on, each dividing to the fourteenth time, at which place they make more than fourscore thousand limbs! When drawn up by the fisherman's line, these rays or arms encircle it in such a manner as to cause it to appear in the form of a wicker basket, hence its name. Several fossil species have been described from the Solenhofen.

Comephorus.—A genus of acanthopterygious fishes belonging to the family *Calliomymidæ* or lyre fish. They have a low first dorsal fin, very large pectoral, and no ventrals. Only one species is known, inhabiting the fresh water lake of Baikal, and is called by the Russians living on its banks, *Galomjoënka*. It lives in deep water, and is thrown up in considerable abundance by the severe storms which visit that lake. It is not fit to be eaten, and crows even, it is said, will not touch it. The Russians, however, extract a large quantity of oil from the fish thrown on shore, and sell it to the Chinese.

Commelyna.—See COMMELYNACEÆ.

Commelynaceæ.—A nat. ord. of monocotyledonous plants, natives of warm climates, and to which the spider wort, *Tradescantia Virginiana*, belongs. The plants of this family have flat narrow leaves, usually sheathing at the base, and some of the species of *Commelyna* have tuberous, fleshy rhizomes, which are used as food. Several species of *Tradescantia* have also been used as medicines by the natives of the countries where they grow.

Comocladia (κομη, hair; κλαδος, a branch)—A genus of dicotyledonous plants, belonging to the nat. ord. *Anacardiaceæ*, containing only a few species which are natives of South America and the West Indies. *C. dentata*, the tooth-leaved maiden plum, is a tree thirty feet high, erect, and of moderate thickness, growing in Cuba and St. Domingo, and abounds in a milky, glutinous juice, which grows black when exposed to the air, and stains linen and the skin black, so that it is almost indelible. It is believed by the natives of Cuba, who call it *Guao*, that it is fatal to sleep under this tree. It has a disagreeable fetid smell. *C. integrifolia*, a native of Jamaica, exudes a similar juice which stains the skin indelibly. It attains a height of twenty feet, and the wood is hard, of a fine grain, and reddish colour.

Compositæ. *Compound Flowers.*—A nat. ord. of dicotyledonous plants synonymous with the class *Syngenesia* of Linnæus. They are characterized by having the flowers united in small heads or *Capitula*, in a common calyx, composed of one or more rows of imbricated leaflets, or bracts, and forming an involucre. Compound flowers form the largest known natural order of the vegetable kingdom, one of the most natural of all the orders, and with the exception, perhaps, of the grasses, are the most generally diffused over the globe. They are calculated to form a tenth part of the whole vegetable world, nearly 10,000 species having been described. In the vegetable kingdom there appears to be on the average about ten species to each genus. In the *Compositæ* many genera are composed of only one species, but many others are so numerous that the average number of species to each genus is brought up to about the same proportion as in the other parts of the vegetable kingdom. In northern regions they are generally herbaceous, but in warm climates they sometimes become shrubby, or even arborescent. They have all more or less bitterness, which is sometimes associated with astringent, acrid, and narcotic qualities. Some possess soporific qualities, others are diuretics, while others again are tonic and stomachic. Two species only furnish articles of food, but many are cultivated in our gardens for their beauty. They are generally divided into three or four great groups or families from the structure of the flowers. See CYNAROCEPHALÆ, CORYMBIFERÆ, CICHORACEÆ, and LABIATIFLORÆ.

Comptonite.—A mineral substance occurring in amygdaloid in Scotland, in lavas at Vesuvius, &c., found usually in masses, having a radiated structure within, and consisting of long fibres or acicular crystals. It is only a variety of THOMSONITE.

Conchifera. *Bivalve Shells.*—A class of animals belonging to the *Mollusca*, provided with two shelly valves, within which is enclosed the body of the animal, the one valve being attached to the right, and the other to the left side of the

body; and from which construction they derive the name of bivalve shells. The oyster, scallop, cockle, and mussel may be taken as examples. The animals are always covered with a two lobed mantle, and within this mantle there are a pair of laminar gills on each side. They have no distinct head; hence they are often called *Acephala*. They are generally free, and walk about by means of a compressed foot, forming for themselves holes in the mud or sand in which to rest. Some form holes in calcareous rocks, others attach themselves to foreign bodies by means of a bundle of fibres, or a beard passing out from the shell. See BYSSUS. The great majority are marine, and many are used as food in various parts of the world. In some of the numerous genera of which this class is composed, the mantle of the animal is furnished at the hinder edge with two tubes or *syphons*. In others, these syphons are wanting, the lobes of the mantle being either free behind, or united and pierced with one or two holes. Hence the *Conchifera* are divided into two large groups or orders; *Siphonida*, with syphons; *Asiphonida*, without syphons. These are divided again into sub-orders from the structure of the foot.

Concholepas.—A genus of shells belonging to the class *Gasteropoda*.—Only one species is known, a native of Peru. It is closely allied to the genus *Purpura*, but by the older conchologists was described as a *patella*.

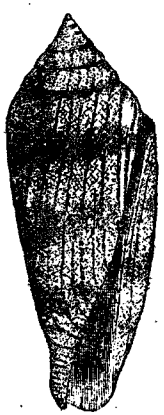
Conchology.—That branch of science which teaches the structure and form of *Shells*. At the period when Linnæus wrote, little was known of the animals which form the substances called shells; hence the attention of naturalists was devoted almost solely to these bodies alone. Linnæus referred all the animals inhabiting shells to five genera. So much has our knowledge increased, however, that now these have become the types of five distinct classes. These are known by the general name *Mollusca*, and the arrangement of shells is now entirely dependent upon the study of the animals which form them and inhabit them. See MOLLUSCA.

Condylura (κονδυλος, condyle; ουρα, a tail).—A genus of animals belonging to the class *Mammalia*, and family *Talpidæ*. Like the moles, to which they are nearly allied, the *Condyluræ* have the fore feet very broad, with five toes, armed with powerful claws, and well adapted for digging in the ground. The genus derives its name from an error made by the describer of the first species, who represented it with knotty swellings on the tail, which do not exist. Another generic name has been conferred upon this species, derived from the circumstance that its muzzle is surrounded with moveable membranous crests disposed in the shape of a star round the opening of the nostrils. The name *Rhinaster* is adopted by several naturalists in preference to the other. *C. cristata*, the crested star-nose, and three or four other species, are natives of North America. They do not make such hills as the European moles, but only subterraneous walks in the fields, forming banks about four inches broad by two inches thick, and which sink in when trod upon.

Confervaceæ = Confervoideæ. *Jointworts.*—A large family of acotyledonous plants belonging to the division *Thallogenæ*, and nat. ord. *Algæ*. The confervæ are the lowest forms of the algæ, and contain an immense number of exceedingly minute and microscopic plants, the history of many of which, however, is as yet but little known. They comprise several subfamilies; PALMELLACEÆ, comprehending some of the simplest forms of vegetable life; ULVACEÆ, indicating a little higher organization; NOSTOCHACEÆ, exhibiting a slight advance over the others; VOLVOCINEÆ, DESMIDIACEÆ, and DIATOMACEÆ, all three only lately removed from the class *Infusoria*, and consisting of vegetables of very simple organization. OSCILLATOREÆ, remarkable for the peculiar motion the plants possess; SIPHONACEÆ, of larger dimensions and higher organization than any of the others, and placed by some authors amongst the fuci. See ALGÆ, and the different words mentioned above.

Conger.—The conger eel. See MURÆNIDÆ.

Conidæ.—A family of shells belonging to the class *Gasteropoda*, characterized by having a shell inversely conical, with a long and narrow aperture. The animal has an oblong foot, the posterior extremity of which is furnished with a small narrow operculum, moves slowly, and is able to inflict a rather severe wound when in-



Conus gloria-maris.

cautiously handled. The genus *Conus*, the ty of the family, contains about 270 species, beauty of which and the richness of their c have long rendered them precious in the amateurs and collectors. Some of the

most valuable shells are found in this genus, and high prices continue to be given for them. A single specimen of *C. gloria-maris* has fetched a sum of £100, and is now valued at £50, and others in proportion to their beauty and scarceness. In Holland, 500 florins have been given for a specimen of the admiral cone, *C. ammiralis*. The species are most abundant in the equatorial regions, but they range northwards as far as the Mediterranean, and southwards as far as the Cape of Good Hope. About eighty species are found fossil, chiefly belonging to the tertiary formations.

Conifera (*conus*, a cone; *fero*, to carry).—A nat. ord. of gymnospermous dicotyledonous plants, characterized by their having the ovules situated on the face of scales, floral bracts or modified leaves, which are placed one upon the other, and so close to each other as to form a *cone*. The species of this order are trees or shrubs with branches, usually resinous trunks, inhabiting all parts of the globe, and of great importance to man. Gigantic in size, rapid of growth, they form a large portion of forests in temperate climates, and are very much cultivated for their utility. The wood, generally light, flexible, and durable, is frequently chosen for the construction of houses and ships. For masts and yards they are in great request, while tar, pitch, rosin, and turpentine, &c., are extracted from them in large quantities. The order is a very extensive one, and has been divided into four sub-orders:—I. *Abietineæ*, or the fir and spruce tribe. See PINUS and ABIES. II. *Cupressineæ*, or the cypress tribe. See CUPRESSUS, JUNIPERUS, and THUJA. III. *Taxineæ*, or the yew tribe. See TAXUS and PODOCARPA; and IV., *Gnetaceæ*, or the joint-fir tribe. See GNETACEÆ. In the ancient globe, the *Coniferæ*, to judge from their fossil remains, seem to have played even a more important part than they do in the present. They appear to have had representatives at every epoch, and they seem more than any other, to have contributed to form those depots of fossil combustibles known as coals.

Conirostres.—A tribe of the extensive order of birds called *Passeres*, characterized by the species having the beak of a more or less conical form, and not notched or dentated at the extremity.

Coniroslum.—A genus of passerine birds belonging to the tribe *Tenuirostres*, and family *Nectarinidæ*. It consists of small birds living on the west coast of Bolivia and Columbia, and feeding on honey, which they suck by their long-coned, straight, compressed beak, from the flowers of trees.

Conium.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*; containing two or three species which are biennial, have a turnip root, a cylindrical and branched stem, finely cut leaves, and white flowers. They are peculiar to Europe. The most common and the best known species is the common hemlock, *C. maculatum*, a plant five feet high, with a fistulous stem marked externally with reddish spots. It has a strong, unpleasant, stupefying smell, resembling that of mice, possessing poisonous properties, grows in waste places, and is more poisonous according as it grows in a warmer climate. Its properties depend upon an alcaloid principle, called *Conia*, which renders it a medicine of great power and unquestionable value. It acts as a sedative to the nervous system, causes sleep, excites perspiration and urine, and exercises a peculiar power upon the lymphatic system. It is in consequence much used in schirrous enlargements, cancer, and scrofula. The remedies in cases of poisoning by this plant, are immediate emetics, purgatives, and injections, and when stupor comes on, strong coffee and exciting drinks. Hemlock has been considered the poison which was employed by the ancient Greeks to despatch Socrates and others condemned to death; but it is now doubted, and Haller was of opinion that it was the *Cicuta virosa*.

Conjugation.—In several families among the lower forms of plants and animals we often see two distinct portions come into contact and the substances become fused, as it were, into a single mass. This process is called *conjugation*. In the case of several families of the algæ, such as the *Desmidiaceæ*, *Diatomaceæ*, *Zygnemaceæ*, &c., the contents of two distinct cells are blended together, and they then become enclosed in a special envelope. In the case of the lower animals the same process takes place; in the genus *Diplozoon*, the conjugation takes place by means of a cross branch, two distinct individuals becoming united, and the sexual organs becoming developed on both bodies after this. In many of the infusoria a similar fusion occurs, though the results have not as yet been observed.

Connaraceæ.—A nat. ord. of dicotyledonous plants nearly allied to the *Anacardiaceæ*. The species, of which about forty-one have been described, are trees or shrubs, all natives of tropical climates, and some of them possessing febrifuge properties. *Omphalobium Lamberti*, a large tree, inhabiting Guyana, produces the beautiful wood now so much used by cabinet-makers, and known as zebra wood.

Connochetes.—A genus of antelopes. See ANTILOPEÆ.

Conocardium.—A genus of bivalve shells. See CARDIIDÆ.

Conocephalus (*κωνος*, a cone; *κεφαλη*, head).—A generic name which has been applied to four different substances. It is a genus of fossil *Crustacea* belonging to the *Trilobites*; a genus of coleopterous insects belonging to the family *Curculionidæ*; a genus of dicotyledonous plants belonging to the nat. ord, *Artocarpaceæ*; and a

genus of *Thallogenæ* or cryptogamic plants belonging to the *Hepaticæ*.

Conopsidæ.—A family of dipterous insects belonging to the group *Athericera*, of which the genus *Conops* is the type. The species of this genus have a peculiar physiognomy; a large nearly hemispherical head with a broad front, and prominent, large, suboval eyes. The perfect flies are harmless, and frequent flowers, but the larvæ live parasitic upon bees of the genus *Bombus*.

Conovulus.—A genus of gasteropodous mollusca. See AURICULIDÆ.

Conus.—A genus of shells. See CONIDÆ.

Convallaria. *Lily of the Valley.*—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, and sub-order *Convallarieæ*. This genus contains several species, two or three of which are much admired. The sweet scented lily of the valley, *C. majalis*, the "Muguet de Mai" of the French, is a native of Europe, Asia, and North America, and is not uncommon in woods in England. Its stem is developed as a rhizome, carrying double radical leaves and flowers of an ivory whiteness on a unilateral pendulous stalk. It is much sought after for bouquets on account of the sweet smell which it possesses. There is procured from it by distillation, a soothing antispasmodic liquor, which at one time enjoyed a great reputation on the continent, as the "Eau d'Or." Solomon's seal, *C. polygonatum*, is also a native of England, and has white, sweet-scented flowers. The rhizome is fleshy and full of knots, which, when cut obliquely, are figured with veins having something the appearance of a seal, hence its name. It is mucilaginous, and in times of scarcity has been made into bread. It is recommended as a cosmetic, and the ladies in the time of Galen used it to remove pimples and freckles of the skin.

Convolvulaceæ. *The Convolvulus* or *Bindweed family.*—A nat. ord. of dicotyledonous plants with bell-shaped flowers, opening or contracting beneath the influence of light. Numerous species belong to this family, the greater number of which are found within the tropics; fewer in temperate climates, and altogether wanting in very cold countries. They are herbs or shrubs, often climbing, and frequently abounding in a milky juice, and many are parasitical upon other plants. The roots generally contain an acrid juice which has purgative properties, and causes several species to be used in medicine. There are forty-three genera, and upwards of 600 species have been described. They are divided into two sub-orders, *Convolvuleæ* and *Cuscutæ*. In the sub-order *Convolvuleæ*, or true bindweeds, the genus *Convolvulus* is the one most generally known, containing above 130 species, some of which are natives of this country, and others are of considerable importance in medicine and the arts, or are cultivated in our gardens for their handsome and showy flowers. The wild convolvulus, *C. arvensis*, is common by road sides, creeping amongst the herbage, has a sweet smell when the sun shines warm upon it, and is said to possess a purgative quality. *C. sepium* and *Soldanella* now form part of another genus. See CALYSTEGIA. The scammony, *C. scammonia*, well known and much employed in medicine as a purgative, is a native of Syria, Cappadocia, and of the island of Rhodes. The roots which are very long and thick, contain, when fresh, a milky juice which is obtained by cutting them across and allowing it to exude into a vessel where it soon concretes. Its active principle is a resin. The drug is imported into this country from Aleppo, in what are called drums, weighing from 75 to 125 lbs. each; and from Smyrna in cakes like wax, packed in chests. That from Aleppo is light and pliable, and is the purest. *C. panduratus* abounds in prussic acid, and is one of the plants from which the liqueur called noyau is prepared. The sweet potato belongs to this family. See BATATAS. The plant from which the well known medicine called jalap is procured is another species of this family, *Exogonium Purga* (= *Ipomœa Purga* or *Convolvulus Jalapa*). It is a native of Mexico, in the neighbourhood of Xalapa, and has a root of a roundish tuberous form, black externally, white and milky within, and varying in size from that of a walnut to that of a moderate sized turnip. It is imported in thin transverse slices, solid, hard, and heavy, and is used either in the form of powder or tincture. Like scammony, jalap owes its active powers to a resin. The quantity brought to this country for home consumption, taking the average of the years 1840 and 1844, amounted to 44,962 lbs. a-year. The drug called turbith is procured from another species, the *Convolvulus Turpethum*, a native of Ceylon. The sub-order *Cuscutæ*, or dodders, are parasitic plants, and possess acrid purgative properties like the bindweeds. There are but two genera, and about fifty species. They are met with in most temperate climates, the seeds germinating in the soil, and the plants afterwards twining round others, and becoming attached to them by means of suckers. They then lose their connection with the soil, and are supported as true parasites. The common dodder, *Cuscuta Europæa*, is a very troublesome and mischievous species. It often attacks leguminous plants and multiplies itself upon them with great rapidity, destroying them either by depriving them of their nourishment, or by strangling them in their folds. It is very difficult to eradicate them when they once gain a footing. *Cuscuta monogyna*, in like manner, attacks and proves very injurious to the vines in Languedoc at particular seasons; and *C. Epilinum* or flax dodder, is equally hurtful to the crops of flax.

Cookia.—A genus of plants. See AURANTIACEÆ.

Copaifera. — A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Cesalpineæ*, containing about twenty species, consisting of trees or shrubs, most of them natives of tropical America, and yielding by incision a balsam well known as the balsam of copaiva, or copivi. There are two kinds of this balsam distinguished, the West Indian and Brazilian. That from the West Indies is procured from *C. Jacquini* or *officinalis*, a lofty tree with a handsome head, which is found growing in the woods of the West Indian Islands—that from Brazil appears to be the produce of several species, and is chiefly procured from Para. Balsam of copaiva is clear and transparent, of the consistence of oil, which however thickens when exposed to the air, and ultimately becomes solid, dry, and brittle like resin. It is used in medicine as a stimulant, cathartic, and diuretic, and is peculiarly adapted for affections of the mucous membranes. It is also used in the composition of varnishes. It is imported in small casks containing from one to one and a-half cwt. *C. pubiflora*, or purple heart, a native of Guyana, yields a timber of remarkable toughness, which makes it very valuable for resisting the shocks caused by the discharges of artillery. It is much used, therefore, in the construction of mortar beds.

Copal. — A resin which exudes from the trunk of *Eleocarpus Copalliferus*, a native of the East Indies, and from which an excellent varnish is made. The resin is hard, dry, light, and of a more or less deep yellow colour. A false gum copal is obtained from *Rhus Copallinum*, a tree growing in Mexico, and which is used in the same way. It is insoluble in water, sparingly soluble in alcohol, but is readily dissolved by ether, nitric acid, and alkalies. A substance closely resembling copal is found as a mineral in the London clay, at Highgate, and is called fossil copal, or Highgate resin. It is softer than copal, and when heated has a resinous and aromatic smell.

Copepoda (*κωπη*, an oar; *πους*, a foot).— An order of animals belonging to the entomostracous *Crustacea*. The species are very small, and have the body only partially covered by the carapace. The body is slender, elongated, and formed like a shrimp, being divided into several rings or segments. The males generally differ in several respects from the female. The large antennæ, or one of them at least, have a swelling near the centre or towards the extremity, followed by a moveable joint which acts like a hinge, by means of which it is enabled to grasp and hold fast the female. The females carry their eggs in a bag which hangs externally from the posterior portion of the body. The ova are very numerous, and the young when first born are very unlike their parent. In their course to maturity they undergo a series of changes or metamorphoses. Those species which have only one eye, or more correctly speaking, two eyes so closely set together as to appear only one, form the families *Cyclopidæ* and *Harpactidæ*, merely differing from each other in the structure of their jaw-feet, and number of ovarian bags. See CYCLOPIDÆ. Those species which have two eyes or more, those in the male being often pedunculated, constitute the family *Pontiadæ* or *Calanidæ;* and those which have two very distinct sessile eyes are placed in the families *Coryceidæ* and *Miracidæ*.

Copper.—A metal found native in various parts of the world, of great importance to man, and in point of utility ranking only inferior to iron. It is harder than silver, and so malleable, that it may be hammered out into leaves so thin, as to be blown about by the slightest breeze. It is very ductile, and possesses great tenacity. It derives its name from its having been first found, or at least wrought to any extent, in the island of Cyprus. With the exception of gold and silver, copper appears to have been more early known than any other metal, and seems to have been even employed by the North American Indians in the construction of arrow-heads and other implements. Copper is found in large quantities in Great Britain, chiefly in Cornwall, Devonshire, Anglesea in North Wales, and in Ireland. The quantity of pure metal raised in 1847, in all England, was nearly 23,000 tons, and in Ireland 14,000 tons. Copper ores are also abundant in Sweden, Saxony, Russia, Persia, Japan, China, Chili, Australia, and about Lake Superior in North America. There is a celebrated mine in Dalecarlia in Sweden, supposed to have been wrought nearly 1,000 years. The copper mines of Japan are amongst the richest in the world, and Japan copper is spread over all the east, where it is in extensive demand in the manufacture of cooking utensils, &c. In India the funeral of every Hindoo is the cause of a great demand of this nature, the relatives of the deceased giving a brass cup to every Brahmin present at the ceremony; so that from 5 to 1,000, and sometimes many more, are dispersed upon such occasions. Various alloys are formed of copper and other metals, which are of vast use to man. Those of tin are of the most importance. Bronze and the metal of cannon is composed of nine parts of tin and ninety-one of copper. Bell metal consists generally of three parts copper to one of tin. The mirrors of telescopes are formed of two parts copper to one of tin. Mirrors are mentioned by Pliny, as being made at Brundusium, of tin and copper mixed. Brass consists of three, and sometimes four or five parts of copper to one of zinc. It is ductile and more fusible than copper. Pinchbeck consists of equal parts of copper and zinc. Tutenag or China silver is composed of copper, zinc, and nickel; and the same substances enter into the composition of German silver. The common ore of copper from which the pure metal is obtained is *Copper pyrites*, composed of copper, sulphur, and iron; but there are many others

occurring in various parts of the world; such as *Gray Copper Ore*, common in the Chilian mines, and composed of sulphur, copper, antimony, and arsenic; *Red Copper Ore*, consisting of copper and oxygen, and occurring in the Bannat, Thuringia, Cornwall, Siberia, Brazil, and the United States; *Black Copper Ore*, or *Tenorite*, an oxide of copper occurring as a black powder, and abundant in some of the mines of the Mississippi valley; *Sulphate of Copper*, *Blue Vitriol* or *Copperas*, composed of sulphuric acid, oxide of copper and water, and occurring in the Hartz, Fahlun in Sweden, &c., as the result of the decomposition of copper pyrites. This substance is largely manufactured, and is extensively used in dyeing, printing cotton and linen, and for various other purposes in the arts. *Green Carbonate of Copper*, known by the name of *Malachite*, and composed of carbonic acid, oxide of copper and water, is another ore, and one of great beauty. The mines of Siberia are peculiarly rich in this substance, masses occurring containing immense quantities of pure malachite. It takes a high polish, and is much used for inlaid work, and as slabs for tables, chimney pieces, and vases, &c. Those who witnessed the Great Exhibition at the Crystal Palace in 1851, will remember the magnificent specimens sent there by the czar of Russia.

Copperas or **Blue Vitriol.**—See COPPER.

Copris.—A genus of beetle. See SCARABÆIDÆ.

Coprolites (*κοπρος*, dung; *λιθος*, a stone).—The fossil excrements of various extinct animals found in the lias, chalk, and coal formations in Great Britain, France, and America, &c.; and identical with masses of a similar kind found within the body of many species of *Ichthyosaurus*. They contain a large quantity of phosphate of lime, and in consequence are valuable as manure.

Coprophagi (*κοπρος*, dung; *φαγειν*, to eat).—A tribe of insects belonging to the order *Coleoptera*, division *Lamellicornes*, and comprising those beetles which live in and feed upon excrementitious matter. It contains three families, SCARABÆIDÆ, GEOTRUPIDÆ, and APHODIIDÆ.

Copsychus.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Luscinidæ*. The typical species is *C. saularis*, the charcoal bird, or magpie robin of Ceylon. It is the Eastern representative of our own red-breasted favourite, and is regarded by the natives of Ceylon with as much interest as the robin is by us. It is generally seen in the neighbourhood of human habitations, where it usually builds its nest. It feeds upon insects of all kinds, and its note, especially in the pairing season, is very pleasing. The song of *C. macrourus*, a native also of Ceylon, is very sweet, and may be heard clear and distinct in the dense jungles at early morn, or amid the lengthening shadows of evening.

Coraciansæ. *The Rollers.*—A sub-family of fissirostral passerine birds belonging to the family *Coraciidæ*. They have a strong broad bill, compressed at the tip, which is slightly hooked, and long, pointed wings. The species are peculiar to the Old World, and feed upon worms, insects, small frogs, &c. Their plumage is in general distinguished by vivid and splendid colours, but their note is very inharmonious. The common or garrulous roller, *C. garrula*, is a British species, and appears to have a very wide geographical range, for it is found over most of Europe, in Asia, visiting the countries between the Black and Caspian Seas, North Africa and Egypt, Senegal and the Cape of Good Hope, and even as far as Japan. It is about the size of the jay, and of an elegant shape; is a very wild bird, builds in birch trees, and makes a loud chattering noise; hence its specific name. The Indian roller, *C. Indica*, is about the size of the common roller, but possesses richer and more vivid colours. It is a native of India. A number of other species are described.

Coracina.—A genus of birds, synonymous with *Pyroderus*. See GYMODERINÆ

Coral.—See ANTHOZOA.

Corallidæ.—A family of corals. See ANTHOZOA.

Corallina.—See CORALLINACEÆ.

Corallinaceæ. *Corallines.*—A family of marine plants belonging to the florideous algæ, and containing two sub-families, the *Corallinidæ* and the *Nulliporidæ*. The corallines are rigid, articulated or crustaceous, generally calcareous sea weeds, the root being an expanded crustaceous disc, often widely spreading, and the frond almost always calcareous. In the *Corallinidæ*, the frond is filiform and articulated, pinnated or dichotomous; in the *Nulliporidæ*, the frond is crustaceous or foliaceous, not articulated, in some of a great hardness, and in others nearly cartilaginous. The genus *Corallina*, which gives its name to the family, contains a good number of species which grow in tufts upon rocks on the edge of the sea, and are found widely diffused in all latitudes, though their geographical centre is in the equatorial regions. They have alternately been considered vegetables and animals by systematic writers, but now are proved to be undoubted plants. Macerated for some time in vinegar or a weak solution of hydrochloric acid, the calcareous crust is dissolved and their structure can then be distinctly seen. *C. officinalis* is the most common species in this country, varying in colour when fresh, but becoming milky white when long exposed to the air. The genus *Melobesia* is the type of the *Nulliporidæ*, but much yet remains to be done in working out the species.

Corallinidæ.—See CORALLINACEÆ.

Coralliophaga (*κοραλλιον*, coral; *φαγω*, to eat).—A genus of bivalve mollusca. See CYPRICARDIA.

Corallium.—A genus of corals to which the red coral of commerce, *C. rubrum*, belongs. See ANTHOZOA.

Corbis.—A genus of bivalve shells belonging to the family *Lucinidæ*. Two handsome species are all that are known in a recent state, natives of the Indian seas, Australia, and the Pacific; but not fewer than eighty fossil species have been described from the lias.

Corbula.—A genus of bivalve shells, forming the type of the small family *Corbulidæ*. They are thick, nearly triangular shells, with a large hinge-tooth in each valve, and the right valve is larger than the left. About fifty recent species are known, inhabiting sandy bottoms, and are found in several parts of Europe, America, Western Africa, and China. About ninety-one fossil species have been described from the inferior oolite.

Corchorus.—A genus of dicotyledonous plants belonging to the nat. ord. *Tiliaceæ*. The species are natives of warm climates, as India, South America, and Japan. *C. olitorius*, or common Jew's mallow, is a native of Asia, Africa, and America, and is cultivated as a pot-herb in Egypt and Syria, particularly by the Jews. The stems of this species and of *C. capsularis*, a native of India and China, and extensively cultivated throughout lower Bengal, are macerated, and from the fibres a coarse kind of hemp is made, called gunny by the natives of India, and which is used by them for making fishing lines and nets, rice bags, and a coarse kind of linen called tat. Besides a large domestic consumption of gunny, the whole rice, paddy, wheat, pulses, sugar, and saltpetre of the country, as well as the pepper, coffee, and other foreign produce exported from Calcutta, are packed in bags or sacks made from this article. They form a considerable article of export also to Prince of Wales Island, Singapore, Malacca, Java, and Bombay.

Cordia.—See CORDIACEÆ.

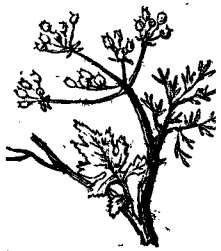
Cordiaceæ.—A nat. ord. of dicotyledonous plants, containing upwards of 180 species, which consist of trees with alternate, rough, exstipulate leaves, panicled flowers, and a drupaceous fruit. They are chiefly natives of warm climates, some of them yielding edible fruits, others possessing a bitter, tonic, and astringent bark. The genus *Cordia* is the type, and contains about 100 species. *C. Myxa*, or the Assyrian plum, is a middle sized tree, about eight or twelve feet high, and grows in India, Persia, Arabia, and Egypt. The flowers are white and sweet scented, and the fruit contains a pulp which is very tough and viscid. It is known as the Sebesten plum, and used formerly to be employed in disorders of the chest and urinary organs. The natives of India eat it when ripe, and when macerated in salted vinegar consider it serviceable in cases of diarrhœa. The wood is soft, and is one of the best kinds for kindling fire by friction. It is believed to have been the wood employed by the Egyptians in the construction of their mummy cases. *C. Sebestena*, or the rough-leaved cordia, is cultivated for its beauty. It is a shrub seven or eight feet high, and a native of the East and West Indies. It is of a beautiful scarlet colour, and has a fine appearance. A small piece of the wood thrown on a pan of lighted coals, perfumes the whole house with a most agreeable smell. The natives of Tahiti, it is said, manufacture from the juice of the leaves of this tree, combined with that of the fruit of a species of fig, a fine red colour with which they dyé their cloths. The wood of *C. Gerascanthus*, a native of the West Indies and Mexico, is considered very valuable, being tough, elastic, of a fine grain, and easily worked. It is called Spanish elm, or prince wood.

Coregonus.—A genus of fish, containing amongst others the Vendace. See SALMONIDÆ.

Coreidæ.—A family of insects belonging to the order *Hemiptera*, of great extent, and comprising some of the largest and most remarkably formed insects in the order. They are generally diversified in their colours, and are found upon plants and trees, upon the juice of which they appear to subsist. They run and fly well, and one or two species make a humming noise as loud as the hive bee. In some, the hind legs are singularly enlarged, especially in the males, the femora being greatly thickened, curved, and spined; in others, the legs are very long, the femora thin, and the tibiæ furnished on each side with a broad and flat membrane, with the edges notched. The genus *Phyllomorphus* comprises some of the most curious species of the family, of small size, and resembling a withered leaf with the edges notched and dilated. They are all exotic.

Corethra.—A genus of dipterous insects belonging to the culiciform tribe of the family *Tipulidæ*. Only a few species are known. The larvæ live in water, and that of *C. plumicornis* is a remarkable looking insect, long, serpent like, very transparent, and having its head armed with two deflexed hooks. It is known to microscopic observers as the skeleton larva, and is very destructive to small insects, entomostraca, &c.

Coriandrum.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*.



Coriandrum Sativum—The Coriander

The coriander, *C. Sativum*, is a native of the southern parts of Europe and the East, but is now naturalized in many parts of France and in

England, as about Ipswich and Suffolk, &c., for the sake of its aromatic seeds. The whole plant when fresh, if bruised between the fingers, exhales a fetid odour like that of the bug, but when dried, its seeds acquire a smell and taste so agreeable, that confectioners and distillers make great use of it, especially on the continent. They are moderately warm, and of a slightly pungent taste, and are considered stomachic and carminative.

Coriaria.—A genus of dicotyledonous plants belonging to the nat. ord. *Coriariaceæ*, of which it is the only representative. About ten species are described, consisting of shrubs, and growing in the south of Europe, South America, India, and New Zealand. The leaves of *C. Myrtifolia* are used to dye black, and an infusion of them gives a dark blue with sulphate of iron. They and the fruit possess poisonous properties, owing to the presence of an alkaloid called *Coriarine*. In 1809, a party of French soldiers in Catalonia, of which country this species is a native, after eating the fruit, were taken ill. Out of twenty who partook of them, three died, and fifteen were seized with a sort of stupor, which lasted some time before it disappeared. The leaves have been used to adulterate senna, and fatal effects are said to have been the result.

Cormogenæ. — A sub-class of acotyledonous plants, and a synonym of *Acrogenæ*. See Acrogenæ.

Cormostomata.—A synonym of *Pœcilopoda*, which see.

Cornaceæ. *The Cornel family.* — A nat. ord. of dicotyledonous plants, consisting principally of shrubs or small trees inhabiting the temperate climates of the northern hemisphere, and not being numerous in species. The genus *Cornus* is the type, containing about twenty-five species, some of which are cultivated in our shrubberies for their bright red shoots, which are highly ornamental in winter, and for their richly coloured fruit. The cornel tree, *C. mascula*, is a deciduous tree with clusters of small starry yellow flowers, and a berry of a red or occasionally yellow colour, about the size of a cherry. They are called cornelian cherries, have an agreeable sourish taste, and make an excellent preserve. The wood is very hard, and in request for particular tools, and for canes. The bracts of some of the species are very large, resemble petals, and being white, are a gay substitute for the flowers themselves, which are small and inconspicuous. The bark of *C. florida* and *sericea* is much esteemed by American physicians as a tonic and febrifuge, and is considered equal to that of cinchona itself. The seeds of the dogwood, *C. sanguinea*, furnish a kind of oil which has been used for burning in lamps, and the fruit of *C. suecica*, or dwarf cornel, a native of the north of Asia, Kamtschatka, &c., and found growing on the Cheviot hills, and other mountainous pastures in this country, is said to be a tonic.

Cornus.—See Cornaceæ.

Corolla.—In most of the exogenous or dicotyledonous plants, the floral envelopes consist of two portions, the *Calyx* and *Corolla*. The external and least coloured is the calyx. See Calyx. The internal and more highly coloured, is the corolla. It is generally the most conspicuous, the gay colours and fragrant odours of flowers being resident in it. It is composed of parts, varying in number, and usually disposed in one or more verticillate rows. These are called petals, from πιτάλον, a leaf. In general the corolla consists of several petals, and it is then called *polypetalous*; when they are united it is called *monopetalous* or *gamopetalous*, and when (which is very seldom the case), the corolla really consists of only one petal, it is called *unipetalous*. Sometimes the corolla is absent, and the calyx then becomes coloured, and assumes the appearance and performs the functions of the corolla. When both are present the plant is called *Dichlamydeous*, when there is only one, it is termed *Monochlamydeous*, and when both are absent, the plant is called *Achlamydeous*. The office of the corolla is to exercise some special influence upon the fertilizing organs of the flower. It does not possess the power of decomposing carbonic acid; it absorbs oxygen from the air, does not part with it again in a pure state, but combines it with its carbon, and throws off the carbonic acid thus formed.

Coronilla. — A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*. The species are numerous, are shrubs or herbs, and inhabit chiefly the south of Europe. The leaves of *C. Emerus*, a small bush, common all over the south of Europe, are cathartic, and often used to adulterate senna. It is hence called scorpion senna. *C. varia*, an herbaceous plant, inhabiting meadows and waste places in the south of Europe and the Crimea, possesses poisonous qualities, the leaves having a diuretic and purgative effect on the human system, though cattle eat them with avidity.

Coronula. — A genus of cirripedes. See Balanidæ.

Corophium.—A genus of crustacea, belonging to the order *Amphipoda* and family *Gammaridæ*. The species of this genus do not leap like the greater part of the gammari, and are further distinguished from the rest of the family by the immense size of their inferior antennæ, which are as long as the body, and serve the purpose of organs for walking. *C. longicorne* is found on the coasts of England and France, and is remarkable for its habits of life. It dwells in holes or burrows, which it forms in the sand amongst the crawls or fish hurdles placed there by the fishermen. It lives upon the marine annelides or worms which inhabit the same places, and it is amusing to observe the manner in which it discovers its prey. As the tide rises, these animals assemble in great numbers, and move about in all directions, beating the sand or mud with their

long antennæ, so as to dilute it, and thus enable them to discover the worms. If they find one, ten, or even twenty times larger than themselves, they unite in order to attack and destroy it, and do not cease their warfare till the mud has been searched once and again. They also attack fishes, molluscs, and dead bodies of animals on the shore. They mount upon the fish hurdles which contain mussels, and the fishermen assert that they eat through the threads which retain the mussels, so as to cause them to fall, that they may more easily be destroyed. In turn, they are themselves the prey of many kinds of fishes and sea birds, which devour great quantities of them.

Corundum (*korund*, the Indian name for this mineral).—A remarkable mineral, composed of pure alumina, and consisting of acute rhomboidal crystals. There is sometimes mixed with the alumina a small portion of peroxide of iron, oxide of titanium, or chromic oxide, to the presence of which substances this mineral owes the colours which its varieties possess. The most frequent form in which it occurs is a six-sided prism; it has considerable density, and is the hardest mineral next to the diamond. It is generally transparent or translucid with a vitreous lustre, and when pure is colourless, though there are several varieties which present more or less bright tints of red, blue, yellow, green, and violet. The *Common Corundum* or *Adamantine spar* is destitute of beauty, being sometimes colourless, but generally gray, brown, or red. This kind comprehends all the Indian varieties from Bengal, Malabar, Thibet, China, and the Carnatic. It is used in the East Indies for cutting and polishing precious stones, as also the granite and other hard rocks, employed in the temples and other public buildings. The *Hyaline Corundum* or *Sapphire*, comprehends all the crystals known as Oriental gems, which from their hardness and intensity of lustre, furnish to the jeweller a number of fine stones, some of which are prized almost as much as the diamond. Such are the *Oriental Ruby* from the kingdom of Ava; of a blood-red or rose-red colour, with sometimes a tinge of violet, a very fine and large specimen of which constitutes one of the jewels of the imperial crown of Russia; the *Oriental Topaz*, of a yellow colour; the *Oriental Sapphire*, of a blue colour; the *Oriental Amethyst*, of a violet colour; the *Oriental Emerald*, of a green colour; the *Opalescent Sapphire* or *Ruby*, consisting of the *Cat's eye* and the *Star Ruby*; and the *White Sapphire*, which is transparent or translucent. These varieties of sapphire are chiefly found in Ava, the mines where they occur being about five days' journey east-south-east from the capital. They are procured by digging and washing the gravel in the beds of rivulets or small brooks. The mines are considered the property of the king, and no stranger is permitted to visit them. The *Emery* or *Iron Corundum*, is another kind of corundum, found in shapeless masses, and in large quantity in the island of Naxos, and in Saxony. It is usually of a gray colour, opaque, of a shining and adamantine lustre, and very hard. It consists of eighty-six parts of alumina, three of silica, and four of oxide of iron. In the shape of powder, emery is extensively used for polishing metals, and other hard bodies.

Corvidæ. *The Crow family*.—A family of birds belonging to the conirostral tribe of the order *Passeres*. They possess a strong conical bill, with the tip slightly emarginated or entire, and their nostrils are covered with stiff feathers which incline forwards. They are generally of a large, massive form, and have strong robust tarsi. The species of this family are widely diffused over the globe. The form of their foot adapts them to traverse fields and pastures with facility, as well as to perch securely on trees, whilst that of their wing insures a powerful and regular flight, steady, without being heavy, and buoyant without wavering. Their sight is keen and distant, and their sense of smelling very acute; they often show great sagacity in their natural actions, possess much docility, and their courage and activity are only equalled by their caution and vigilance. In most of the species inhabiting temperate climates their plumage is sombre, but many in tropical countries exhibit considerable brilliancy and variety in their colouring. The family *Corvidæ* is numerous in species, and is divided into six sub-families. The true crows, *Corvinæ*, have their strong bills more or less arched, wings long and pointed, and feet strong, and formed for walking. They are generally seen on the ground, searching for carrion, worms, &c., are very wary and cunning, and usually build their nests in trees. They are sometimes gregarious in their wild state, uniting in large flocks, and placing a sentinel to warn them of the approach of danger. Their note is for the most part harsh and unpleasant, but most of them may be taught to imitate the human voice to a certain extent. They have a natural instinct for concealing the objects of their food when they are satisfied, in order to return to it afterwards. They hide other objects also, as pieces of metal, or anything that is shiny. They are almost all omnivorous, some preferring carrion, others feeding upon living animals, as moles, mice, young game, eggs, &c., while the rook and one or two others live upon insects, worms, and seeds fresh sown. They carry their food to their young in their crop, and disgorge it to feed them with. They are thus fed by their parents for a length of time, and do not quit the nest till they are able to fly. The genus *Corvus* is the type, and contains several well known species. The raven, *Corvus Corax*, is the largest of all the birds belonging to the passerine order, and equals the domestic cock in size, its usual length being about two feet two inches. The general colour of the raven is black, finely glossed with blue

and no bird exhibits finer symmetry, or more beautiful proportions than he does. It is proverbially long-lived, and instances are mentioned where it has attained the age of 100 years. Ravens are more retired birds than most others of the genus; they live in pairs, fly very high, build in lofty trees and holes of rocks, and return year after year to the same spot. Their favourite food is carrion, and a bad smell exhales from their bodies. They are easily domesticated, and possess many qualities which render them very amusing. They are bold and mischievous to other animals, especially to cats or dogs, with whom they dispute their food, and often beat them off. In times of ignorance the raven was looked upon with an evil eye. From its black colour, its lugubrious croak, and fetid odour, it was long considered a bird of ill omen; and among the ancients, was one of the birds to whose movements much attention was paid by the augurs. The raven appears an almost universal species, being found in both Old and New Worlds; in the one extending from Greenland to the Cape of Good Hope, and in the other from Hudson's Bay to Mexico. It is also found in Japan. The common or carrion crow, *C. Corone*, is smaller than the raven, but is similar in habits, colour, and form. They are more numerous, live in pairs in the woods, feed upon carrion, worms, insects, small animals, and even fruits and seeds. During the period when they are rearing their young, they commit great depredations upon young game and poultry. At one time they appear to have been exceedingly numerous in England, and laws were enacted for their destruction. They build their nest in trees of moderate height. They are considered to be susceptible of impressions from changes of weather, and by their croaking are believed to predict rain. The crow is common throughout Great Britain and Ireland, and abounds also in many parts of the continent of Europe; it is said also to be a native of Japan. The rook, *C. frugilegus*, is often confounded with the crow. It is nearly of the same size, has the same form, and a similar colour. The chief difference consists in the rook having the base of the bill covered with a rough, scabrous skin, which in old birds is white. These birds are gregarious, and live in society the whole year through. They build their nests in flocks, they seek their food in flocks, and in flocks they retire to rest. They build in trees, sociably placing their nests close to each other, and often in the midst of populous towns, and return to the same nests year after year. These nests are called *Rookeries*, and the number of individuals in a rookery is often very great. At Newliston, near Edinburgh, in 1847, no fewer than 2,663 nests were counted in one rookery, and the number of inhabitants was considered to amount to 10,000. Rooks feed upon insects, chiefly larvæ, and more especially the larvæ of the dor beetle or cockchafer (*Melolontha vulgaris*), and seeds. At seed time when the farmer is sowing his corn, and in harvest when he has reaped it, the rooks no doubt devour much grain, but it is a disputed point whether the destruction of injurious insects by these birds does not more than compensate the farmer for their thefts in the corn fields. The rook is spread over the greater part of Europe; but though abundant in most parts of Great Britain and Ireland, is not found in Orkney or Shetland, and does not exist, it is said, in the Channel Islands. It has been found between the Black and Caspian Seas, and like several others of the genus has been noted as a native of Japan. The hooded crow, *C. Cornix*, is rather larger than the rook, and has the back and under parts of a pale ash colour, while the head, neck, wings, and tail are black. It is a bird of passage, visiting England in the beginning of winter along with the woodcock, and leaving in spring, but in the western and northern parts of Scotland it remains all the year. It frequents the sea shore, and lives principally upon shell fish and crustacea—though occasionally when it penetrates inland, it will attack sickly lambs, poultry, &c. The jack-daw, *C. monedula*, is smaller than the rook, of a black glossy plumage above, with the eye white, and the hinder part of the head and neck of a silvery-gray. They live in flocks, and frequent church steeples, old towers, and ruins, and build their nests there, seldom in trees. Jackdaws are very common in England, are easily tamed, and may be taught to imitate the human voice. They live on insects, flesh, eggs, grain, fruits, &c., and have the mischievous propensity of the order for stealing and hiding money, silver spoons, and other glittering and metallic substances. The magpie, *Pica caudata*, is famed perhaps above all the other species for this habit, and tales of this kind are common in every village. It is smaller than the jackdaw, and has more variety of colour. The head, neck, and breast, are of a deep black glossed with green, purple, and blue, whilst the under parts and scapulars are of a snowy white. It feeds upon both animal and vegetable substances, destroys great numbers of grubs and slugs in our pastures, and often performs a friendly office for sheep and oxen, by getting on their backs and freeing them from troublesome vermin. It builds its nest very carefully, defending it externally with sharp thorns, and leaving only a narrow entrance. The magpie is very noisy and mischievous, restless, and quarrelsome, but may be easily tamed, and taught to pronounce words and short sentences. It is a social but not a gregarious bird, and has always been an object of superstition with the vulgar. It appears to be widely distributed, is common in Great Britain and many parts of the continent of Europe, is plentiful in North America, and occurs in China and Japan. The nutcracker, *Nucifraga Caryocatactes*, is about the size of the jackdaw, and has the plumage of the head,

neck, and body, of a dark brown colour with white spots, while the wings and tail are shiny black, the feathers being tipped with white. It lives in woody districts, and is more formed than any other species of the *Corvinæ* for climbing trees. It feeds upon fruits and insects, and it taps the bark of the trees with its bill to get at the larvæ underneath. It builds its nest in holes in the trunks of trees, and is occasionally found in England. It is common in France, the Alps of Switzerland and Savoy, and extends to Siberia and Kamtschatka. A species called the South Sea raven, *Corvultur albicollis*, only a little smaller than the raven, and of a dusky black plumage, with a white patch on the neck, is found in the interior of South Africa, where it assembles in large flocks, and feeds on carrion. It is also found in the South Sea Islands. The second sub-family of corvidæ, the *Phonygaminæ*, separated from the genus cracticus, contains several birds all exotic species, and inhabiting chiefly Australia and New Guinea. They have lengthened bills with the culmen smooth and rounded, and a circular notch scalloped out of the feathers of the forehead. They pursue small birds, and are very noisy and clamorous. The piping crow, *Gymnorhina (Barita) tibicen*, is an exception, however, to this last character. See BARITA. The third sub-family is that of the jays, *Garrulinæ*, which contains several well known species. They have a rather short bill, terminating in a sudden curve, their wings are short and rounded, and they generally possess a moveable tuft of narow lanceolate plumes on the forehead.—The jays live in the forests of various parts of the world, and feed on fruit, worms, &c. Their plumage is usually gay, and even brilliant. The common jay, *Garrulus glandarius*, from its variety of brilliant colours, is one of the handsomest of our native birds, and is perhaps the most elegant of all the *Corvidæ*. It is common in this country, and is found in most of the temperate parts of Europe, frequenting woods, and feeding on acorns, beech mast, berries, and fruit of various kinds, insects, and young birds, &c. The jays are great enemies to the gardener, and in summer make sad devastation upon his peas and cherries. They have a harsh grating voice, and a petulant, restless disposition. When an owl or other bird of prey appears in the wood, they utter piercing cries, and assemble in great numbers to attack the common enemy. Sportsmen are often treated in the same manner, and have their sport cut short by their vociferous noise. When domesticated, they can be taught to imitate the human voice, and various sounds, especially of a harsh and grating character, as the noise of a saw, &c. There are various other species of jays described, natives of foreign countries, amongst which, perhaps, the most beautiful is the blue jay of America, *G. cristatus*. He has a bright violet, white, and sky-blue coat, long tail, and pointed crest, a plumage of which he seems not a little proud, but his voice is harsh and screaming, and may be heard over all the other feathered inhabitants of the grove. These birds are very destructive to the crops of maize or Indian corn, often assembling in large flocks to devour it. The fourth sub-family, *Callœatinæ*, contains several species natives of Africa, Asia, and Australia. They have a short elevated bill, with the upper mandible arched, and the base furnished with velvet feathers. They are seen generally on the ground instead of on trees, and feed on insects and berries. The fifth sub-family, *Gymnoderinæ*, contains some singular birds peculiar to South America. Their bills are straight and depressed, wide at the base, and narrow at the tip. They live chiefly on fruits. The last sub-family is that of the choughs, *Fregilinæ*, the species of which are natives of the elevated mountains of the Old World. They have a slender, elongated bill, compressed on the sides, with tip scarcely emarginated, and lengthened wings. They feed on insects and berries. The Cornish chough, or red-legged crow, *Fregilus graculus*, is taller and longer than the jackdaw, but resembles it a good deal in its habits. Its colour is of a beautiful black, glossed with blue and purple, the bill is orange-red, and its legs are of the same colour, but with black claws. It builds its nest in high cliffs by the sea side, ruined towers, &c. It is found in several parts of England and Scotland, but is said not to occur in any other parts of Europe, except the Alps, and the mountains of Greece. It is a native of some parts of Asia, Africa, and Egypt. The chough is easily tamed, and is fond of being caressed by those to whom it is attached. It has been stated, that amongst the other mischievous propensities which it possesses along with the rest of the family, it is very apt to catch up bits of lighted wood, and that many instances have occurred of houses having been set on fire in consequence.

Corvultur.—See CORVIDÆ.

Corvus.—See CORVIDÆ.

Corycæidæ.—A small family of entomostracous crustacea. See COPEPODA.

Corydalis.—A genus of dicotyledonous plants belonging to the family *Fumariaceæ*, and containing about forty species, which are natives of temperate regions, and are found in all the four quarters of the globe. *C. claviculata* is a rather elegant climbing plant, a native of Great Britain. Two or three species are naturalized in this country, but this is the only native. Some of the species have tuberous roots, which have been used in medicine. Those of *C. tuberosa* are hollow, and contain a bitter peculiar alkali called *Corydaline*; they are used on the continent under the name of *Radix Aristolochiæ* for discussing indolent tumours. The tubers of *C. bulbosa* were at one time used as anthelmintics and emmenagogues.

Corydia.—A genus of insects. See BLATTIDÆ.

Corydon.—A genus of cockatoos, a synonym of *Callocephalon*. See CACATUINÆ.

Corylaceæ. *The Nut tribe.*—A sub-family of dicotyledonous plants belonging to the large nat. ord. *Amentaceæ*, and containing many trees and shrubs that are valuable either for their nuts or for their timber—such are the oak, see QUERCUS; the chestnut, see CASTANEA; the horn beam, see CARPINUS; the beech, see FAGUS, &c., &c. The genus which gives the name to the family, and which is valuable for the nuts it produces, is the *Corylus* or hazel, containing several species, natives of Europe, Asia, and America. The common hazel nut, *C. avellana*, is the best known and the most common. It is a native of all the cooler parts of Europe, Northern Asia, and North America, and is the parent of many varieties of nuts and filberts now cultivated for their fruit. It is very common in Great Britain, and grows in Scotland at an elevation of 1,600 feet above the level of the sea. The hazel is cultivated both in this country and on the continent for its fruit, and several varieties are distinguished. 1, *Sylvestris*, or common hazel nut; 2, *Grandis*, or the cob nut; 3, *Glomerata*, or the cluster nut; and 4, *Tubulosa*, or filbert; made by many botanists a distinct species. It occurs as a large shrub or small bushy tree, the branches being useful for many purposes, such as for poles, fishing-rods, walking-sticks, and various kinds of wicker work. The wood is said to make the best charcoal for gunpowder, and is also used for making crayons for drawing purposes.

Corylus.—See CORYLACEÆ.

Corymbiferæ.—A sub-order of dicotyledonous plants forming part of the nat. ord. COMPOSITÆ, and characterized by the absence of albumen, and erect seed, a hemispherical involucre, and the florets of the ray, when present, being ligulate. The species have the general bitterness common to the whole order, and some of them have an aromatic odour, from the presence of volatile oil. They produce more active secretions, and have been used more extensively by man, than those of the other subdivisions of the order. Many possess properties similar to those of *quinine*, and are used for the same purposes. See INULA. Others from the combination of the aromatic oil with the bitter principle, are both tonic and stimulant. See ANTHEMIS, ARTEMISIA, &c. The roots of some are tuberous, and used as food, as the Jerusalem artichoke. See HELIANTHUS. Many of them form the ornaments of the garden. See CHRYSANTHEMUM, DAHLIA, ASTER, &c. This subdivision contains by far the largest number of the genera of the order *Compositæ*.

Coryuidæ.—A family of zoophytes. See ANTHOZOA.

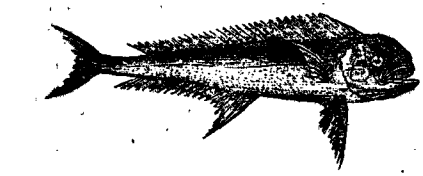
Corypha.—A genus of palm trees. The species are of great height, peculiar to the equatorial parts of both Old and New Worlds, and containing about fifteen species, possessing a cyme of elegantly palmate fronds. The talipot palm, *C. umbraculifera*, a native of Ceylon, is the type of the genus, and is a lofty tree, rising with a perfectly cylindrical stem to the height of from sixty to seventy feet, with an elegant crown of eight or ten large leaves, disposed like an open umbrella, and covering a space of forty feet in circumference. The flowers are in numerous panicles, having a strong overpowering scent, and are succeeded by thousands of spherical berries about the size of apples, and containing a nut, the kernel of which has a firm substance. The Indians make tents, umbrellas, and gigantic fans of the leaves, which are eighteen feet long and fourteen broad, and they also use them as a thatch for their houses. The *Tamul* books are formed of these leaves, attached together by a cord, and upon the epidermis of which the characters are inscribed by an iron style. Bracelets are made of the nuts, turned, and polished, and the pith of the stem furnishes a sort of flour, from which bread is made. The expressed juice of the tender branches of the spathes is said to be emetic, and to be beneficial to persons bitten by serpents. *C. Gebanga*, a native of the East Indies, is a very useful palm to the inhabitants. Its pith furnishes a sort of sago; the root is useful in diarrhœa; the leaves are used for thatch, and for making hats; fishing nets and shirts are woven from its fibres, and ropes are made from its twisted leaf stalks. The carnahuba palm, *C. cerifera*, a native of Brazil, furnishes wax from its leaves, which is obtained by shaking them. The wood is used for veneering, for stakes and palisades, and the leaves for thatch, hats, and pack-saddles.

Coryphodon (κορυφη, a point; ὀδους, a tooth).—A genus of fossil animals belonging to the family of tapirs. It is founded on a single specimen of part of the lower jaw, which was dredged from a considerable depth in the sea between St. Osyth and Harwich.

Coryphœna.—See CORYPHŒNIDÆ.

Coryphœnidæ. *Fish-Dolphins.*—A family of acanthopterygious fishes formerly forming part of the large family *Scomberidæ*. They are characterized by having the body long, compressed, slender, and covered with numerous small scales. The head is large and trenchant. They have thoracic pectoral fins, and a dorsal fin extending along the whole length of the back, composed of long flexible rays. The species are all oceanic fishes, remarkable for the beauty of their colours. The genus *Coryphæna* is the type, and the common coryphene or dolphin, *C. hippuris*, is celebrated amongst voyagers, and was well known to the ancients. It is a brilliant fish, about four and a-half feet in length, and is so swift in its motions, that it darts through the water like a radiant meteor. We have often seen it swimming round a fast ship at her full speed, as if she were at anchor. Its dorsal fin is sky-blue with gold coloured rays;

the tail fin is green, and the back green, mottled with orange, while the belly is of a silvery lustre, separated from the back by a yellow lateral line. As it swiftly cuts through the water, there is an extraordinary play of colours upon it, and at night it forms the most beautiful object that can well be conceived. What has chiefly rendered it famous, however, is the remarkable changes of colours it presents when dying, a circumstance which has rendered this fish a favourite with poets of all ages. The dolphins live chiefly upon the flying fish, and



Coryphæna Japonica.

make sad havoc amongst them within the tropics where they abound. Their flesh is not much esteemed, being very dry, and possessing little flavour. This fish must not be confounded with the true dolphin (*Delphinus*), which is also a classical animal. Several other species have been described, most of them natives of the Mediterranean. *Our* figure represents a species from the seas of Japan, *C. Japonica.*

Corystes.—A genus of crustacea. See BRACHYURA.

Cosmarium.—A genus of microscopic plants belonging to the nat. ord. algæ and family *Desmidiaceæ*. The species inhabit fresh water, chiefly lakes and marshy ponds, amongst the stems of sphagnum. Thirty species have been described, mostly very pretty microscopic objects.

Cossus.—A genus of nocturnal lepidopterous insects belonging to the family *Bombycidæ*. The larvæ of these insects are very destructive to trees, forming galleries under the bark. The best known and most common species is the goat moth, *C. ligniperda.* The perfect insect is one of the largest of the European moths, being nearly three inches in the expansion of its wings, and the caterpillar is nearly as thick as a man's finger, and about three inches in length. This creature feeds upon the wood of several kinds of trees, as the poplar, aspen, and oak, though it seems to prefer old pollard willows. It takes nearly three years to arrive at its full growth, and during that time, it causes the greatest mischief to the tree in whose substance it lodges, and without giving cause to be suspected. When it has arrived at maturity, it fabricates a cocoon of the gnawings of wood, which it fastens together by a glutinous secretion, and lines with silk. This is so placed, that the end corresponding to the head of the crysalis is turned towards a hole, which it has had the precaution to form beforehand, in the bark of the tree, on that side from which it is about to escape. This hole remains closed outside, but it is so thin, that the slightest effort can break it, and let the prisoner free. The chrysalis itself bursts this hole, and escapes about half way through it, before it breaks its own bonds, and assumes its perfect form. The larva has a very disagreeable odour, which adheres to the hands, if touched, for a considerable time, and has given rise to its English name.

Costus.—A genus of monocotyledonous plants belonging to the family *Zingiberaceæ*, consisting of herbaceous plants growing in the tropical parts of the globe, and under both hemispheres. Their roots are tuberous and creeping. About fifteen species are known, amongst which *C. speciosus*, indigenous to the Isles of Sunda, is the most beautiful, and whose roots are considered by the Indians as a powerful bitter tonic.

Cotinga.—A genus of birds. See AMPELIDÆ.

Cotoneaster.—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*, and containing several species which are well adapted for shrubberies, and are cultivated for this purpose in England.

Cottidæ. *Bull Heads.*—A family of acanthopterygious fishes allied to the gurnards, but having the head round, and the lower rays of the pectoral not separate from the rest. The ventrals are under the pectorals, and they have two distinct dorsals. The genus *Cottus* is the type of the family, and in this genus the head is large, depressed, and in many of the species armed with spines and tubercles; the mouth is large, and they have small teeth on the jaws and vomer, but none on the palate. Some of the species are inhabitants of the fresh waters, and others of the sea. The river bull head or miller's thumb, *Cottus gobio*, is a small fish about three inches long, with a large flat head, without spines, and a wide mouth, and the skin naked, or without visible scales. It inhabits fresh waters in Europe generally, is common in England, and spawns in March and April. It lives upon worms and larvæ of insects, and swims with great rapidity. Its flesh is good, and becomes red when cooked. The miller's thumb is chiefly found in streams in which pebbles abound, and has several enemies, amongst which is the eel. The species which live in the sea are of heavy and ungraceful forms, and their head is armed with numerous spines. The sea scorpion, or short spined cottus, *C. scorpius*, is the most common, occurs frequently in the little pools left on our coasts by the retiring tide, and feeds upon small crustacea, and the fry of other fishes. It is about eight or nine inches long. The long spined cottus, or father lasher, *C. bubalis*, is about the same size as the last, and resembles it in most respects. Both of them are solitary fishes, living during winter at great depths, which they quit in spring, to establish themselves among rocks near the shore, covered with sea-weed. The liver yields

a quantity of oil, and they are not esteemed as food. The fishermen dread a wound from the spines of these animals, on account of the depth to which they penetrate. They are able to live a long time out of water, make a loud grumbling noise at the approach of bad weather, and have no air bladders. The genus *Aspidophorus* is distinguished by the body being covered with angular scaly plates resembling armour. The armed bull-head or pogge, *Aspidophorus Europæus*, is a small fish about five inches long, common on the British coasts, and frequently taken by our fishermen in the shrimping nets. The habits of this fish appear to be very similar to those of the sea scorpion.

Cottus.—See COTTIDÆ.

Cotunnite.—A white mineral substance named after Cotunni, a Neapolitan physician, and found in the form of needles in the lava of Vesuvius. It is a native chloride of lead.

Coturnix. *The Quail.*—A genus of birds. See TETRAONIDÆ.

Couma.—A genus of dicotyledonous plants belonging to the nat. ord. *Apocynaceæ*, and containing only one species, which is a lactescent tree growing in Guiana, with triangular branches, verticillate leaves, and rosy panicled flowers. The fruit is about the size of a plum, rounded, slightly depressed, of a red colour, and enclosing two or three grains, surrounded with a pulp of the colour of rust. When unripe they are bitter, but when ripe they taste sweet and pleasant, and are sold in the markets as "couma pears."

Coumarouna.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, and synonymous with DIPTERIX. The well known and sweet-scented tonga bean is the seed of one species of this genus, the coumarou of the natives of French Guiana, in which country it is found, *C. (Dipterix) odorata*. This species is a tree with a stem from sixty to eighty feet high, three and a-half feet in diameter, and bearing a large head of tortuous stout limbs and branches. The flowers are of a purple colour, washed with violet, and the fruit is an oblong, hard, dry, fibrous drupe, containing a single seed, the kernel of which has an extraordinary agreeable odour. The natives string the seeds into necklaces, and the creoles place them among their linen, both for the sake of their scent, and to keep away insects.

Couratari.—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, and containing only two species. *C. Guianensis* is a fine handsome tree, with large flowers of a white colour, washed with purple, and disposed in axillary spikes. The wood is much esteemed for carpentry work. The bark of the tree is very viscous, which enables the natives to climb it in order to collect the fruits, &c.

Coussapoa.—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and sub-order *Artocarpeæ*. It contains about four species which are natives of tropical America, and consist of milky climbing trees or shrubs. They climb parasitically upon other trees, and let fall from the tops of these a number of branches which take root in the ground. These branches join, and form a sort of trunk, which encircle the tree upon which they originally climbed, enveloping it as in a sheath, and finally as it were suffocating it.

Crabro.—See CRABRONIDÆ.

Crabronidæ. *Wood Wasps.*—A family of insects belonging to the order *Hymenoptera*, of considerable extent, and comprising insects of moderate size often closely resembling wasps in their appearance and colouring, and of great activity. They are especially fond of settling on the broad leaves of plants exposed to the sun; and most of them excavate cells in rotten wood, &c., in which they deposit their eggs, with a stock of food for the young when hatched. They are generally known by the name of wood wasps in consequence. Some of the species of the family are parasites, though most of them form their own nests, and each species appears to select its own particular food for its larvæ. Those of the genus *Crabro* select chiefly dipterous insects. *Tripoxylon* collects spiders; and the species *T. figulus* has been observed carrying these insects into holes in posts and thatch of houses, placing them in cells, separated from each other by a double partition of clay, a single egg being placed in each cell, attached to the abdomen of a spider, and as many as twelve or more spiders, if small, have been placed in one cell. The species of *Pemphredon* and *Diodontus* provide aphides for the food of their young. Some of the *Crabronidæ* form their cells in sand, and the beautiful British genus *Cerceris* makes them in the earth, in footpaths, and other places exposed to the sun, and provisions them with *Curculios* or weevils; while *Philanthus* burrows in hot sandy situations, and provides hive bees for the food of its young.

Cracidæ. *The Curassows.*—A family of birds belonging to the order *Gallinæ*. The bill in this family varies in form, but the base is surrounded by a soft skin. The tail is large and rounded, composed of broad rigid feathers; the hind toe is long and placed on a level with the others, forming a good perching foot; the head is sometimes crested or ornamented with curled feathers, and the windpipe is very variously twisted. The species are peculiar to tropical America, living in the woods and building in trees; they are easily tamed. They are divided into two sub-families, each containing several species. The true curassows, *Cracinæ*, have a short, compressed bill, much arched from the base, and their orbits and cheeks are more or less naked. They are very numerous in the woods of South America, and feed upon fruits, buds, and roots. The crested curassow, *Crax alector*, is about the size of a small hen turkey, and

possesses a deep black plumage, with a slight gloss of green upon the head, neck, back, wings, and upper part of the tail. The head is adorned with a crest of curled feathers from two to three inches in length, velvety in appearance, and capable of being raised or depressed at will. It is a native of Mexico, Guiana, and Brazil, in the woods of which countries it congregates in large flocks, and appears naturally tame and unsuspicious of man. They are good eating, and form an excellent resource to the hungry traveller when short of provisions, their flesh being white, and, it is said, surpassing that of the guinea fowl or pheasant in the delicacy of its flavour. Two or three species of the genus *Crax* are described, all very easily tamed, and offering great facilities for being domesticated in this country, and supplying our farm-yards with a new breed of poultry. The pauxi or galeated curassow, *Ourax Pauxi*, is about the size of the crested curassow, and is, like it, a native of Mexico, congregating in large companies and perching upon trees. The female makes her nest on the ground and leads her young about, in the same manner as our common pheasant and domestic hen do theirs. The mountain pheasant, *Oreophasis Derbyanus*, is a fine example of the family. It is a native of Australia. The penelopes, *Penelopinæ*, have a slender bill, broad at the base, curved and gibbose at the tip. They live in small flocks upon such trees as they frequent for the sake of the fruits; though occasionally they are found on the ground searching for worms, insects, &c. The guan, *Penelope cristata*, is about thirty inches long, of a dusky black or bronze colour, glossed with green, changing to olive in certain lights. It has a thick tufted crest, which it can raise or depress at will, and a naked skin under the throat, of a scarlet colour, capable of being inflated or swollen. It is a native of Guiana and Brazil, and its flesh is said to furnish an excellent dish for the table. Though they are generally found in bands, the guans pair together with the strictest constancy. They have a peculiar conformation of windpipe, which causes them to have a very loud and clamorous cry. Several other species have been described possessing very much the habits and manners of the curassows, but building their nests on trees.

Crambe.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and sub-order *Raphaneæ*, containing about fifteen species of herbs or under shrubs growing on the shores of the Mediterranean, Central Asia, and in Patagonia. They are rare in the north of Europe, though the species which is probably best known is a native of the English coast, and extends even as far the polar circle. This is the sea kale, *C. maritima*, which is much cultivated for the table as a vegetable. The young shoots are the parts eaten, being blanched in spring, and when boiled are considered to be little inferior to asparagus.

Crambus.—A genus of nocturnal lepidopterous insects or moths, and belonging to the family *Tineidæ*. The species are of small size, are numerous in this country, about forty having been described, and are known by the name of *Veneer Moths*.

Crangon. *The Shrimp.*—A genus of decapodous crustacea belonging to the section *Macroura*. The most common and best known species, *C. vulgaris*, or common shrimp, is about two and a-half inches long, of a grayish-brown colour, dotted all over with dark brown, and does not become red by boiling. It so closely resembles the sand in colour, that in the pools left by the retiring tide, the animals are with difficulty distinguished. It is an abundant species on our sandy coasts, and is taken in immense quantities for the table. The people who fish for them are called *Shrimpers*, and, in order to catch them, use a large net with a semicircular mouth, which they push forwards before them, along the bottom of the sea at ebb tide. They wade nearly to their middle for hours together, raising the net at intervals, and taking out the shrimps, which are secured in a bag. This fishery gives employment to many hundreds of people on our coasts. The shrimps are in spawn throughout the year, and cast their shells in March, April, and May.

Crania.—A genus of molluscous animals. See BRACHIOPODA.

Craspedocephalus.—A genus of serpents. See CROTALIDÆ.

Crassatella.—A genus of molluscous animals belonging to the class *Conchifera*, and forming the type and only genus of the family *Crassatellidæ*. The species are handsome marine shells, with the cartilage placed in an internal triangular pit near the cardinal teeth. They are thick, solid, and ventricose, and covered with a smooth epidermis. About thirty recent species are known distributed through Australia, New Zealand, India, West Africa, and Brazil. The fossil species are still more numerous, fifty having been enumerated belonging to the neocomian formation, and occurring in Europe, especially in the Paris basin, United States, and Patagonia.

Crassinidæ.—A small family of molluscous animals belonging to the class *Conchifera*, and containing several recent and numerous fossil species. The shells of *Astarte* are cordate, compressed, concentrically grooved, and covered with a thick dark brown epidermis. Fourteen recent species are known, natives chiefly of northern regions, and abundant in the arctic seas, such as Wellington Channel, and Behring's Sea, in Norway, Britain, &c. Two hundred fossil species of this genus are enumerated, occurring in the lias, and found in North and South America, Europe, and Thibet. A number of species belonging to the genus *Cardinia*, occur fossil in the valuable layers of clay ironstone called *mussel*

bands, in Derbyshire. No recent species of this genus now exist.

Crassula.—See CRASSULACEÆ.

Crassulaceæ. *The Houseleek family.*—A nat. ord. of dicotyledonous plants, containing many species of succulent herbs or under shrubs, growing in the driest situations, or in rocks, walls, and sandy plains, in various parts of the world; on the sun-scorched cliffs and volcanic soil of the Canaries, and on the dry sterile plains of the Cape of Good Hope. The genus *Crassula* is the type, and about fifty species belonging to it have been described. Most of them are natives of South Africa, in the neighbourhood of the Cape of Good Hope, are succulent plants, and in many cases of curious growth. *C. vestita* and *C. corallina* bear a great resemblance to the sea corallines. *C. odoratissima* has yellow flowers, which possess a very sweet odour, especially at night. *C. tetragona* is used at the Cape as a remedy in dysentery. The genus *Sedum* contains a number of species, several of which are natives of Great Britain. The common stonecrop, *Sedum acre*, grows on stone walls capped with earth, and on rocks, and is remarkable for the peculiar acrid disagreeable taste it leaves in the throat when chewed. The genus *Sempervivum* belongs also to this family, one species of which, the houseleek, *Sempervivum tectorum*, is well known in this country, growing on the tops of cottages, and the leaves of which are so popular as a remedy for cuts and corns. The expressed juice mixed with cream or milk is a very soothing application in severe itching. The species of the genus *Bryophyllum* are remarkable for possessing proliferous leaves. On the edges of the leaves of *B. calycinum*, germinating buds are formed which are capable of producing independent plants.

Cratægus. *The Hawthorn.*—A genus of dicotyledonous plants belonging to the pomaceous tribe of the nat. ord. *Rosaceæ*. The species of this genus are natives of temperate climates, inhabiting woods and hedges throughout the northern hemisphere from Barbary and Palestine to about 60° N. lat. in the East, and from Mexico to a similar latitude in the West. They are small trees and shrubs growing to a moderate height, and the flowers of most of them possess a fine aromatic odour. To this genus belongs our common hawthorn, *C. oxyacantha*, "the sweet-scented May," so frequently the theme of our pastoral poets. The beauty of the flowers and the sweet fragrance they exhale, are too well known to need description. Upwards of sixty species and well marked varieties of *Cratægus* are cultivated in this country, and for the ornament of park scenery there is probably no genus of flowering trees at all to be compared with it. Upwards of twenty species, besides varieties, are cultivated in the shrubbery on the north side of Kensington Gardens, flowering in succession from the middle of May to the end of June, and rendering the air at times quite redolent of perfume.

Cratævus.—A genus of dicotyledonous plants belonging to the nat. ord. *Capparidaceæ*, and containing several species, natives of the West Indies, and called garlic pears. The fruit of the common garlic pear, *C. Tapia*, is about the size of a small orange, has a strong smell of garlic, and communicates its odour to the animals that feed upon it.

Crax. *The Curassow.*—A genus of birds. See CRACIDÆ.

Cremilabrus (*crena*, a cleft; *labrum*, the lip).—A genus of pharyngognathous fishes belonging to the family *Cyclo-Labridæ*, and containing several species abundant in the Mediterranean, more rare on the coasts of the Northern Ocean, and a few appearing to wander into the Indian Sea. Amongst the most brilliant of the species is *C. pavo*, having a mixture of lively colours, green, yellow, and red. Several species occur, but not abundantly, on the coasts of Great Britain, generally of rather small size, and of no value as food for man.

Crepidula (*crepidula*, a small sandal).—A genus of shells. See CALYPTRÆIDÆ.

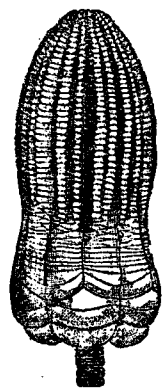
Crepuscularia.—A section of insects belonging to the order *Lepidoptera*, containing the genus *Sphinx* or hawk moth of Linnæus, and forming part of the *Heterocera* of Boisduval, Westwood, and others. The insects mostly fly in the morning or evening twilight, and are, as it were, intermediate between the *Diurna* or butterflies which fly by day, and the *Nocturna* or moths which fly by night.

Crescentia. *The Calabash Tree.*—See BIGNONIACEÆ.

Cricetus. *The Hamsters.*—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Muridæ*. There are four or five species described, the typical and most common being *C. vulgaris*, or the common hamster. This animal is distinguished by having a short tail and two enormous cheek pouches, which will hold a quarter of a pint. In size it resembles the brown or Norway rat, is of a reddish-brown colour above, and black below, and is a native of the sandy deserts of the north of Europe, and Asia, Austria, and many parts of Germany, Poland, and the Ukraine, Russia, Siberia, and Tartary. It is an herbivorous animal, and consumes a great quantity of grain; after satisfying its appetite taking care to fill its cheek pouches till they are ready to burst with the booty. The hamsters live in burrows, which they form under ground, and the male and female live separately except for the short season of courtship. They are by no means amiable in their manners, rejecting all society with one another, and will fight, kill, and devour their own species. They are hybernating animals, laying up a store of food in their burrows, and remaining in a state of torpidity during the severity of winter. Their chief enemy is the pole-cat, which destroys great numbers of them. Their fur is said to be valuable, and the peasants in the countries

where they most abound destroy them in great quantities for the purpose of obtaining their skins.

Crinoidea.—A class of animals belonging to the *Echinodermata*, and characterized by the species being furnished with five arms, having a series of processes on each side like a feather. The arms are generally forked at their base, and often repeatedly subdivided. Their body is surrounded with hard shelly plates. This class contains several families, most of which are fossil. One recent genus is free (see COMATULA), but the other, *Pentacrinus*, and many of the fossil genera, has an elongated peduncle, which is furnished with claspers like those on the back of the *Comatula*, and was in all probability attached by its base. *P. Caput Medusæ*, is the only recent species of this genus, and is a native of the West Indies. Some authors have asserted that this species must be an animal crawling along the bottom of the sea; but from the specimens that are preserved, it is much more probable that it stands more or less erect in the sea, bending down so as to yield to the force of the waves, and rising again when the storm is over. Four or five specimens only are known, and in none of them is the base perfect. The peduncle is a long column, formed of numerous pentangular joints, and having five auxiliary side arms, formed of round joints, proceeding from it at intervals. At the upper extremity of this column is a pelvis, consisting of five plates, from which ten arms proceed, subdividing into three fingers. Another species (British) has been described under the name of *P. Europæus*, which is now ascertained to be merely the young of *Comatula rosacea*. Several species are found fossil, occurring in the lias formation. *P. Briareus*, the briarean pentacrinite, is the best example, and is found at Lyme Regis, Watchet, Keynsham, &c. Though the species belonging to this family are of very rare occurrence in a recent state, they must have been of great numerical importance among the earlier inhabitants of the ancient deep. Countless myriads of their petrified remains fill whole limestone beds of the transition formation, and compose vast strata of entrochal marble, extending over large tracts of country in northern Europe and North America. The joints which compose the stem are called *Entrochi* or wheelstones, and being perforated in the centre of the joints they are capable of being strung as beads, and have been used as rosaries. In the north of England they are found in great numbers on the sea shore, and are called "St. Cuthbert's beads." The name *Encrinite*, or stone lily, is applied generally to all these fossil species. The best known is the lily-shaped encrinite, *Encrinus liliiformis*, which is found in the Muschelkalk of Saxony, Westphalia, and in Brunswick. The animal was permanently attached by exuded indurated matter, and consists of a long column formed of numerous round joints, and a pelvis composed of five pieces, from which ten tentaculated arms or fingers proceed. The pear encrinite, *Apiocrinus*, is only found in the middle region of the oolitic formation. The animal was permanently affixed by its base, and the column consists of round joints adhering by



Encrinites moniliformis—The Stone Lily.

radiating surfaces, the superior twelve or fourteen of which gradually enlarge at their apex, and sustain the pelvis, from which the arms and tentaculated fingers formed of simple joints proceed. It occurs in several places in England and France. *Apiocrinus rotundus*, from its occurring at Bradford in Wiltshire, has been called the Bradford pear encrinite. Many other species forming various genera, such as *Poteriocrinus*, *Platycrinus*, *Cyathocrinus*, *Actinocrinus*, &c., occur in the mountain limestone of Yorkshire and elsewhere.

Crinum. — A genus of monocotyledonous plants belonging to the nat. ord. *Amaryllidaceæ*, and containing a number of species, handsome plants, and great ornaments to the garden. The poison bulb, *C. Asiaticum*, a native of the East Indies, has a cylindrical bulb above ground, which is a powerful emetic, and is used by the natives for the purpose of producing vomiting after poison has been taken.

Crioceras (κριος, a ram; κερας, a horn).—A genus of fossil cephalopodous mollusca. See AMMONITIDÆ.

Crioceridæ. — A family of tetramerous coleopterous insects belonging to the section *Phytophaga*. The beetles belonging to this family are brilliant in their colours, and interesting in their habits. Many of the species when taken hold of, emit a sound similar to that produced by some of the *Cerambicidæ*, caused by the friction of the prothorax against the base of the mesothorax. They are found principally upon flowers, and fix their ova on the under surface of leaves. The larvæ are soon hatched; are short and thick, with a soft body, and smooth skin. As they increase in size, they eat the whole thickness of the leaf, feeding upon it in a peculiar manner,

not as other insects, advancing forwards, but taking portion after portion beneath their bodies, and thus retiring a step backwards at each morsel. The larvæ of the lily beetle, *Crioceris merdigera*, has a singular and apparently disgusting contrivance for protecting itself from the heat of the sun, or the rapacity of insectivorous birds. The anal aperture is placed on the back, so that the excrement of the animal, when expelled, remains on the back, instead of falling to the ground. By degrees this is thrust forwards towards the head, until a perfect covering is formed for the whole body, and as it is not attached to the skin, it can disembarrass itself of it when it becomes so large as to be inconvenient. The larvæ of the asparagus beetle, *C. Asparagi*, feed upon the leaves of the asparagus, to which plant it is occasionally very injurious.

Crioceris.—A genus of insects. See CRIOCERIDÆ.

Crithmum. — A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*. The species are glabrous, fleshy, suffruticose herbs, and are few in number. *C. maritimum*, the samphire, is the principal, and the one best known, and is the plant mentioned by Shakspeare as growing on the cliffs at Dover. It grows there still, and is found on the rocks of the sea coast of Britain, France, Italy, and Spain, &c. The leaves are pickled in vinegar, and are used in this form at table. It is cultivated in some places for the purposes of diet. The proper name is said to be *Sampire*, and to be a corruption of *St. Pierre*.

Crocodilidæ. *The Crocodile family.*—A family of reptiles forming part of the order *Emydosauri*, and containing the crocodile, gavial, alligator, &c. They are in appearance gigantic lizards, but they differ from the animals belonging to the order *Saura*, in having the body covered with square, keeled, bony plates, imbedded in the skin, a compressed tail, and a large depressed head with a wide gape, and a short fleshy tongue. They have long jaws, with a single series of conical teeth inserted in sockets. They have short legs, and webbed feet, and live in fresh or brackish water. Their brain is small compared with the size of the cranium, and in consequence, the animals belonging to the family show but little intelligence. They are oviparous, and their eggs are about the size of that of a goose, and covered with a hard calcareous shell. The female deposits them in places she considers suitable for hatching them, but does not sit upon them. Some species deposit them on the banks of rivers, covering them with sand, and leave them to be hatched by the heat of the sun. Others deposit them in moist places, and cover them with a quantity of leaves and herbs, which generate sufficient heat to hatch them. The young are very small when first born, considering the large size of the parent, but they acquire their growth very rapidly. The species are not numerous, and are confined to warm climates. None are found recent in Europe, nor have they been detected in Australia; they are only to be found in Asia, Africa, and America. They live on animal food, chiefly fishes, and when they seize a large animal, they drag it under the water, and leave it for some time to macerate before they devour it. The species are peculiar to particular parts of the world. The gavials are only found in India; the alligators are peculiar to America, and the crocodiles, properly so called, are natives both of the Old and New Worlds. The alligators, forming a small family of themselves divided into three genera, *Jacare*, *Caiman*, and *Alligator*, are distinguished from the rest of the *Crocodilidæ* by their feet not being webbed, by their being less aquatic in their habits, and by the canine teeth of the lower jaw fitting into a pit in the edge of the upper jaw. They have a strong smell of musk. The alligator, *Alligator lucius*, a native of North America, and abundant in the Mississippi, is a formidable and ferocious creature, prodigiously strong, and sometimes reaching the length of eighteen feet. It is provided with numerous sharp teeth, long, tenacious claws, and a powerful tail, a single blow of which is capable of overturning a canoe. It chiefly preys by night, assembling in large numbers, besetting the mouth of some retired creek, into which they have previously driven the fish, and bellowing so loud that they might be heard at the distance of a mile. It is said to attack men and quadrupeds, whilst bathing, or crossing the rivers, and to be more fierce and voracious than the other species of this subfamily. In winter, it buries itself in the mud, at the bottom of the swamps and marshes which it inhabits, and continues in a torpid state till spring. The name *Alligator*, is derived from the Portuguese word, "logarto," a lizard. The cayman, *Caiman palpebrosus*, is a native of South America, chiefly Brazil, and is remarkable for the bony structure of the eyebrows, which form large knobs the size of a man's fist. The cayman does not attain so large a size as the alligator, nor does it appear to be so ferocious. It never ventures to attack a man on dry land, nor even in the water, provided he keeps his arms and legs in motion. The yacare, or spectacle alligator, *Jacare Sclerops*, appears to be spread over the whole of tropical America, though more especially abundant in Brazil, and acquires a size equal to that of the alligator. The orbits of the eyes are surrounded by large prominent rims of bone, connected together by an intermediate ridge, presenting very much the appearance of a pair of spectacles. They never attack men, or even dogs, in passing the rivers, but live upon fish and water fowl. They are active at night, but in the middle of the day they come ashore to enjoy the heat of the sun, and sleep profoundly. Their eggs, which are white, and about the size of those of a goose,

are much sought after by the Indians, and are preyed upon by the vultures, who destroy great numbers of them, and the very young. The crocodiles, consisting of the genera *Gavialis*, *Mecistops*, and *Crocodilus*, and forming like the alligators a small family by themselves, are characterized by their feet being webbed, rendering them more aquatic in their habits; by their hind legs being provided with a fringe of compressed scales behind, and by the canine teeth of the lower jaw fitting into a notch in the edge of the upper jaw. The upper jaw of the animals of this family is generally said, but erroneously, to be moveable. This mistake arises from the fact, that the lower jaw is much produced posteriorly, and articulated with the upper very far back.—The true crocodiles, *Crocodilus*, are natives of Africa, the West Indies, and America, and the best known species is the Nilotic crocodile, *C. vulgaris*. This animal is a native of the Senegal river, of the Niger, and other rivers of Africa, but more particularly of the Nile, in Upper Egypt, where it attains the length of about thirty feet. The crocodile was held in great veneration

Crocodilus vulgaris—Leviathan Crocodile.

amongst the ancient Egyptians, by whom it was known under the name of *Champsa*. The city Arsinoe was called by some of the early writers *Crocodilopolis*, the city of crocodiles; and Strabo informs us, that a public fish pond was under the charge of priests, who kept a tame crocodile in it, which they called *Suchus* (σουχις); this being also the name of the god Saturn. The crocodiles are exclusively carnivorous, and are ferocious creatures. Their numbers, however, are kept down by the enemies which surround them. For the adults, few animals could be their match, but the little ichneumon or mongooz, devours their eggs in great numbers, while lying hatching in the sand, and birds of prey pounce upon the young at quitting their shell, and before they are able to reach the water. The gavials, *Gavialis*, are natives of India, have canine teeth like the crocodiles, but are distinguished from them by their muzzle being very long and slender, and surmounted, in the male, by a singular protuberance. Their feet are webbed, and the hind legs are furnished with the crest which is seen in the crocodiles. The Indian gavial, or Gangetic crocodile, *Gavialis Gangeticus*, is abundant in the Ganges, the Hoogly, and other rivers of India, and acquires a length of seventeen feet. It is even more essentially aquatic than the crocodile, and from its strength and size is a most formidable animal. It is said, in India, to destroy many human beings in the water every year, and though it lives chiefly on fish, it devours the dead bodies of men and animals committed to the "sacred river," and is thus useful in preventing the putrid matter from corrupting the water. The species of the genus *Mecistops* are little known, and are natives of Africa and New Guinea. Fossil remains of the family *Crocodilidæ* are abundant in the different formations, from the lias to the eocene. Those of the tertiary formations are not very numerous, though several species have been found in the Paris basin, and in the London clay. The different genera or sub-families we have mentioned above, in their recent state, are confined to different portions of the world, *Alligators* to America, *Crocodiles* to Africa and America, and *Gavials* to India. Not one form exists in Europe, and yet in a previous state of this world's existence, we see from the fossil remains of these animals, that all three of these forms existed at one and the same time in England; three or four species of *Crocodilus* being found in the eocene beds of the isle of Sheppey, and Hordwell Cliff, a species of *Alligator* in Hampshire, and a *Gavial* in the eocene deposits of Bracklesham. Remains of these animals are much more numerous in the secondary formations, and the species have been arranged under several different genera, such as SUCHOSAURUS (σουχις, crocodile; σαυρος, a lizard); GONIOPHOLIS (γωνια, rectangular; φολις, a scale), species of both of which genera have been found in the Wealden; *Teleosauras* (τελεος, perfect; σαυρος, a lizard), one species of which has been discovered at Caen, another in the lias of Yorkshire, a third from the calcareous schists of Manheim and Boll, and a fourth from the Kimmeridge clay of Oxford.

Crocodilus. *The Crocodile.*—See CROCODILIDÆ.

Crocus.—A genus of monocotyledonous plants belonging to the nat. ord. *Iridaceæ*, and containing many beautiful bulbous rooted plants, which are cultivated as great ornaments to our gardens. The vernal crocus, *C. vernus*, is the species which is so much cultivated in this country as a spring flower, and many varieties have been produced. The saffron crocus, *C. sativus*, is the species from which the saffron of commerce is procured. It is a native of Greece and Asia Minor, where it has been cultivated from time immemorial, and is one of the plants mentioned in the Old Testament. The stigmata of the flowers are of a deep orange colour, and these when dried in the loose state form the hay saffron, and when compressed into cakes, the cake saffron of the shops. The plant is cultivated in Cambridgeshire, and though saffron is imported to this country from Sicily, France, and Spain, the English saffron is

always preferred. Saffron contains an active volatile oil, which has been used in the form of tincture and syrup, as an emmenagogue and antispasmodic. The colouring matter is called *Crocine* or *Polychroite*.

Crosstedtite.—A mineral substance occurring in black masses, as an emmenagogue and antispasmodic. The colouring matter is called *Crocine* or *Polychroite*.

Crotalidæ. — A family of scaly reptiles belonging to the order *Ophidia* or serpents, characterized by having a large pit on each side of the face, placed between the eye and the nostril. This family contains a good many genera, and is divided into those which have the tail ending in a spine, as *Craspedocephalus, Lachesis, Trigonocephalus*, and *Cenchris*; and into those which have the tail ending in a rattle, the *Crotalina*.

Crotalina. *The Rattlesnakes.*—A sub-family of serpents belonging to the family *Crotalidæ*, and containing the species so well known as the rattlesnakes. They are peculiar to America, and derive their name from the tail terminating in a series of membranous cells, or horny joints, fitting one into the other, which are dry and moveable, and which, when the tail is shaken, and this the animal can do at pleasure, causes a noise similar to that produced by ripe seeds rattling in a dry pod. The rattlesnakes are very venomous, and amongst the most dangerous of all known serpents, their bite being generally attended with rapidly fatal effects. The poison remains powerful for a length of time after the animal's death, and several extraordinary instances have been mentioned of naturalists having had severe wounds from the fangs of specimens long preserved in spirits, and even after having been prepared as a skeleton. Some of the North American Indian tribes hold the rattlesnakes in great reverence, and are afraid to kill them, believing that the spirit of the slaughtered serpent will excite its living relations to revenge upon them its death. They are said to be fond of music; and Chateaubriand tells us that he saw an enraged rattlesnake calmed down by the tones of a flute, and led about following the music. They are likewise related to possess a wonderful fascinating power upon other animals, such as birds, squirrels, hares, &c., by which means the poor creatures are, as it were, charmed, and run into the serpent's mouth. This extraordinary quality is generally believed in America, but it would appear rather to be the effect of extreme terror, than any charm or fascination. Five species of *Crotalina* are described, the best known of which is the common rattlesnake, *Crotalus horridus*, growing sometimes to the length of eight feet; and though a very dangerous animal, seldom or never attacking man, or even the larger animals, without being previously provoked or disquieted.

Crotalus (κροταλον, a little bell). *The Rattlesnake.*—See CROTALINA.

Croton.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and containing many species which are trees, shrubs, or herbs, and peculiar to tropical America and the hot parts of Asia and Africa. Some possess powerful medicinal properties, and others yield products that are useful to man. The bark of *C. Eleuteria*, a native of Jamaica, furnishes a tonic astringent and febrifuge substance, which is known in commerce by the name of *Cascarilla*. The bark is obtained from some other species also; and what is known as the *Copalchi bark*, likewise used as a tonic medicine, is the produce of *C. suberosus*. The seeds of several species yield a purgative oil. That expressed from those of *C. tiglium*, a native of India, is extremely powerful, and though used in medicine, requires much care in its administration. Applied externally, croton oil produces pustules on the skin, and is hence much used as a rubefacient and counter-irritant. All parts of this plant appear to possess the purgative properties alike. The active principle contained in them is called Tigline or Crotonine. The leaves, when chewed, inflame the mouth, lips, and fauces of those who use them, and the seeds thrown into water intoxicate fish. *C. variegatum* is a handsome plant, and is cultivated in India for the beauty of its foliage. The leaves are beautifully variegated with green and golden-yellow, and are used by the natives as an ornament both in times of festivity and at the funerals of unmarried persons. *C. balsamiferum*, a native of the West Indies, abounds with a thickish, yellowish, sweet-scented, balsamic juice, which, distilled with spirits of wine, yields a cordial liquor called Eau de Mante. From *C. lacciferum*, a tree growing in Ceylon, Cochin China, and Cambodia, a very fine kind of lac exudes spontaneously, which is very pure, of a bright red, and furnishes a brilliant varnish, which is used by the Cingalese, but scarcely ever finds its way to England. *C. thuriferum* exudes a fragrant resin analogous to incense, and three or four other species yield, when wounded, a resinous substance of a deep red colour, resembling dragon's blood.

Crotophaga (κροτων, a tick; φαγω, to eat). *Horn-bill Cuckoos.*—A genus of birds belonging to the order *Scansores*, and family *Cuculidæ*. The species are natives of the hot and humid parts of America and the West Indies, and are called *Ani* in Guiana and Brazil. They live in flocks, frequenting the skirts of woods and the borders of flooded savannahs, and feed on insects, small lizards, and seeds. They are bold and fearless birds, scarcely appearing to be frightened by the sound of a gun, and as their flesh is rank and disagreeable they are little molested. Many pairs use the same nest, which is very large, composed of dry twigs, and lined with leaves,

and it is said the parent birds feed the young indiscriminately. The most common species is the Jamaica blackbird, *C. ani*, a bird rather larger than the common blackbird of this country, and a native of the West India islands. It lives chiefly upon ticks, &c., and may frequently be seen jumping about the cows and oxen in the fields, and often flying on their backs, to get at the vermin. It is a very noisy bird, but may be easily tamed, and taught to speak.

Crozophora.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and containing seven species which are small shrubs or herbs, and are almost peculiar to Africa. *C. tinctoria* is a small annual, a native of the south of Europe, and cultivated about Montpelier, for the sake of the deep purple dye called *Turnsole*, or litmus, which it produces.

Cruciferæ (*crux*, a cross; *fero*, to carry.)—A nat. ord. of dicotyledonous plants which derives its name from the petals of the flowers being disposed in the shape of a cross. The species are very numerous, and form an extremely natural family, the greater number inhabiting the temperate zones of the western hemisphere. A considerable number, however, are found in the colder portions of the southern hemisphere, but they are rarely met with under the torrid zone, only showing themselves on mountains where they find a temperature nearly equal to that of the higher latitudes. A few are shrubs, but the larger number are annual or biennial herbs. The juice which they contain is generally acrid, and possesses stimulant and antiscorbutic qualities. In some, however, these qualities are softened down, and changed to an agreeable taste, which causes them to be sought after as food, especially when the juices are mixed with a large proportion of mucilage. The roots of many acquire a great thickness. The flowers are white, yellow, purple, or occasionally blue, and frequently scented. The tissue of the cotyledons is often oleaginous, so that many are cultivated for the manufacture of oil. The form of the fruit is very variable, in some being long and slender, forming what is called a *silique*, in others being round and short, forming a *silicle*. About 2,000 species are described, and they are arranged in tribes or subfamilies, according to the form of the pod or seed vessel, and the structure of the embryo. Many well known and most useful plants belong to this order, such as the cabbage and turnip—see BRASSICA; the mustard, see SINAPIS; the sea kale, see CRAMBE; scurvy grass, see COCHLEARIA; the horse radish, &c., &c.

Crustacea (*crusta*, a crust or hard shell).—A class of animals belonging to the division *Annulosa*. They are articulated animals with jointed legs, respire by means of branchiæ or gills, and have a double or complete circulation of blood. They are for the most part covered with a hard crust or external shell—hence their name. The shell has for its base a peculiar substance, which is found also in the covering of insects called *Chitine*. In some, the shell, or carapace as it is called, is extremely hard or almost stony, as in the crab and lobster, the *chitine* in these being in small quantity, whilst a large portion consists of carbonate of lime. In others, as in the entomostraca, the carapace is of a horny consistence, containing a large portion of *chitine* and albumen, and little or no carbonate of lime. The body is divided into rings or joints, by means of which the animal possesses a considerable degree of freedom of motion, even in those which have the carapace the hardest. In some of the species this external covering is endowed with brilliant colours. The normal number of the rings or joints is twenty-one, but two or three are often blended together, or soldered into one. To each of these joints, except the last, there is attached a pair of members, the forms and uses of which vary much in the different species, according to their age, &c. These members are always divided into joints or articulations, the number of which is very various. They are covered with the same envelope or crust as the body itself. This structure is well seen when the creature moults or casts its shell. During the time the animal is growing in size, the shell or carapace does not grow in equal proportion. In order, therefore, to permit the growth of the body to go on, this solid covering is thrown off, and a new one, exactly fitted to the increased size of the animal, is formed. When young, these moultings are of frequent occurrence, and it is astonishing to see the perfect manner in which the covering of the body, feet, antennæ, &c., is thrown off, without any portion of it being destroyed or broken. The crustacea differ in habits as well as in appearance from each other. Most of them live in the water, but there are some which inhabit the land, and are called *land crabs*. Of these the horseman crab, *Ocypoda*, form deep burrows in the sand by the sea shore, live in the holes during the day, and when disturbed run very fast. Others, as the calling crab, *Gelasimus*, when in their holes fill up the entrance by means of one of their claws which is much larger than the other, and when they are out of their burrows have the singular habit of holding this claw up as if they were beckoning to some one in the distance. The hermit crabs, *Paguridæ*, live in the empty shells of mollusca, which they seize, often killing the inhabitant, and adopt as their houses. Some of these, the *Cœnobitæ*, occupy shells with wide mouths, and close up the entrance with their large claw. Others, as the tree lobsters, from the Indian ocean, *Birgus*, instead of shells, take possession of holes in the mountains and in rocks, ascend palm trees, and devour the fruit. The pea crabs, PINNOTHERES, on the other hand, live within the shells of bivalve molluscs while the animals are alive. The greater part of the crustacea are provided with jaws and organs of mastication—such are all the *Malacos-*

traca and part of the *Entomostraca*; whilst others have no organs adapted for mastication, and live as parasites on fishes, &c., sucking the juices of their bodies—such are the *Siphonostoma* and *Lerneidæ*. The larger number are carnivorous, and many even devour their own species. They respire by means of organs analogous to the gills of fishes, which are either exclusively formed for that use, or are members modified and adapted for that purpose. By their means the animals separate the oxygen contained in solution in the water in which they live. They vary much in number and shape in the different species, but are generally placed near the base of the legs, and are protected by the border of the carapace, though a few have them placed externally. The blood in the crustacea is colourless, and when observed by the microscope, is seen to contain a great quantity of albuminous globules suspended in it. There are no absorbent vessels, and it thus appears that the chyle is carried into the blood by imbibition. They possess a heart which by its muscular action propels the blood over every part of the body, through a well-developed system of arterial vessels. After it has served for the nourishment of the different organs, it is carried into the veins, which are rather reservoirs or lacunæ than vessels properly so called, and from them through the branchiæ or gills. After traversing these organs it returns directly to the heart, to run anew the circle just mentioned. The nervous system of the crustacea consists of a chain of ganglions more or less numerous, united by nervous cords. The normal number of these ganglions is equal to that of the joints of the body, but sometimes they are double, and at others they appear to be much fewer in number, owing to several being united together into one mass. Thus in the spinous crab, *Maia squinado*, there are only two ganglions, one in the head and the other in the thorax, connected together by two nervous cords; whilst in the leaping shrimp, *Talitrus*, there are two ganglions to each articulation of the body (of which there are thirteen) connected with each other by a transverse commissure, and to the ganglions in each succeeding ring by a nervous cord or filament. Intermediate formations may be observed in other crustacea, showing the gradual modifications that take place between these two extremes. From these ganglions the nerves are distributed to the different organs and members of the body, and to the muscles which move them. The sexes are distinct. The males have not as yet been seen in all, but there is good reason to believe, that, with the exception of the cirripedes or barnacles, the two sexes exist separately in all cases, though in some the males differ very much in appearance from the females. They always produce their young by means of eggs, which in most, or all instances, are fecundated within the body of the female before she lays. In some genera the young are fully formed in the internal ovary of the mother, and are extruded alive. In many the young at birth are like the parent, but in others they are very unlike, and undergo several changes, amounting almost to a kind of real transformation, before they assume the perfect form. The class *Crustacea* has lately been divided into three great groups or sub-classes—the stalk-eyed crustacea, or PODOPTHALMA; the sessile-eyed crustacea, or EDRIOPTHALMA; and the barnacles, or CIRRHIPEDA. Numerous species of crustacea exist in a fossil state. A whole order of extinct forms are found in the Silurian and Devonian rocks, called TRILOBITES, no living representatives of which exist at the present day.

Cryolite. *Fluoride of Aluminium.* — See FLUORIDES.

Cryptocephalus.—A genus of coleopterous insects belonging to the family *Chrysomelidæ*, the larvæ of which reside in tubes, which they carry about with them, and which, in one species at least, was found to be formed of the excrement of the animal, moulded to its proper form by the assistance of its mandibles.

Cryptochiton.—A genus of shells. See CHITONIDÆ.

Cryptogamia.—A class of plants. See ACOTYLEDONES.

Ctenizа.—A genus of spiders. See ARANEIDÆ.

Ctenoidea (κτεις, a comb).—An order of fishes formed upon the structure of their scales. These have the outer or posterior edge toothed like a comb. The perches and other allied families are referred to this order, and several fossil genera belong to it.

Ctenomys (κτεις, a comb; μυς, a rat).—A genus of animals belonging to the order *Rodentia* or *Muridæ*, and containing five or six species which are natives of Chili and other parts of South America. They are externally similar to rats, but they have a very soft fur, strong fore-feet, and burrow under ground. They live chiefly upon roots and herbs, and are very abundant in the central parts of Chili, where they congregate in hundreds, forming burrows which are rather shallow but communicate with each other. From their numbers they prove very destructive to the fields of corn. The typical species is the tucu-tuco, *C. Braziliensis*, which is about the size of the common water rat, but with a fur like that of the squirrel. The wide plains north of the Rio Colorado are completely undermined by this animal, and where Patagonia blends with Terra del Fuego the whole sandy country forms a great warren. Nocturnal in its habits, it lives almost entirely underground, and is well known to the natives and travellers by the peculiar noise it makes in its burrow. This consists of a short, but not rough, nasal grunt, which is repeated about four times in quick succession. The name *Tucutuco* is given to it in imitation of the sound.

Ctenophora.—A genus of jelly fishes. See ACALEPHÆ.

Cubeba. *The Cubebs Pepper.*—See PIPERACEÆ.

Cucujides.—A sub-family of insects belonging to the tetramerous *Coleoptera* and family *Engidæ* or *Xylophaga*. The insects belonging to this family are of a depressed form, with beaded or moniliform antennæ, projecting mandibles, and tarsi with entire joints. The genus *Cucujus* is the type, the species of which are of small size, flat, and live under the bark of dead trees.

Cuculidæ. *The Cuckoos.*—A family of birds belonging to the order *Scansores*. They have a slightly arched, compressed beak, and a long rounded tail and short feet. These latter organs are not strictly scansorial, though the toes are placed in pairs, two directed forwards and two backwards. They neither use their bill for climbing, like the parrots, nor for making holes in trees like the woodpeckers, neither can they mount perpendicular stems like the creepers, but they climb in a manner peculiar to themselves, to which their large tails contribute much assistance. Their wings are short, and their flight is feeble; indeed it is seldom exercised except to convey them from one tree to another. Their food consists of insects chiefly, and many of the species are birds of passage. One of the most curious parts of their history is, that many of the species are *parasitic birds*, depositing their eggs in the nests of other birds, and leaving them to be hatched by the foster parent. The species are numerous, and their habits and structure enable them to be divided into several sub-families. The true cuckoos, *Cuculinæ*, have a slender bill, with the culmen arched and the sides compressed. The wings are longer than in the other sub-families, and the true cuckoos fly with greater strength and rapidity than the other species. They are inhabitants of the warmer parts of both hemispheres, and they live on snails and fruits as well as insects. The common cuckoo, *Cuculus canorus*, is about fourteen inches long, the upper parts of a dark ash colour, the breast and belly white, crossed with black wavy bars. It is the only species of the family that is a native of Europe. It arrives in this country early in spring, and leaves us again about the middle of July. Whence they come, and whither they go, is not quite well ascertained, but it is believed that they come to us from Northern Africa or Asia Minor, and return to the same quarter in autumn. Popular interest has been so much confined to the parasitic habits of the cuckoo, that upon many other points of its economy we are still in comparative ignorance. This parasitic habit was known to the ancients. Aristotle mentions it as a fact, and Pliny corroborates it; and though one or two moderns have attempted to throw doubts upon the subject, it is too clearly ascertained to be gainsaid. In this country the nests usually selected are the hedge sparrow, the pied wagtail, and the meadow pipit, and generally only one egg is deposited in each nest. When hatched, the young cuckoo soon becomes sole tenant of the house she lives in. The back has a depression in the middle of its surface, and naturalists, from personal observation of the fact, inform us that the young intruder, insinuating itself under the egg or nestling of its foster-parent, gets it upon the hollow of its broad back, and never rests till it has shouldered and jerked it out of the nest. If two cuckoos, we are further told, are hatched in the same nest, a fierce contest commences, and only ceases by the stronger throwing the weaker overboard. It has been calculated that the cuckoo annually destroys about 3,500,000 eggs of other birds. The name of this bird is derived from the peculiar note it has in spring, and is nearly the same in Greek, Latin, Italian, French, German, Danish, Swedish, Norwegian, Welsh, and English. In the latter part of its residence in this country its note is nearly limited to an indistinct "gowk," whence it derives its name in Scotland and in some parts of England. The cuckoo is mentioned in the Bible, though some commentators affirm that the Hebrew word is not properly translated. It bears no inconsiderable part in ancient fable, and it formerly took its place amongst the delicacies of the table. Several species of the *Cuculinæ* inhabit America, and these rear their own young instead of depositing their eggs in the nests of other birds. The honey-guides, *Indicatorinæ*, have short, strong, and somewhat conic bills, rather long pointed wings, short tarsi and feet, and the middle toe long. They inhabit South Africa, and are famed for guiding the natives to the nests of wild bees, enticing them to the spot by flitting before them and reiterating their peculiar cry of "cherr, cherr!" They are furnished with a very hard skin, but the bees attack their eyes. They are held in great veneration by the Hottentots, who take care, when they spoil a bees' nest, to leave their little guide its share. The rain birds, *Saurotherinæ*, have a lengthened bill with a curved tip and serrated margin. Their wings are short and rounded, and their tarsi are long and robust. They inhabit South America, where they live on snakes, fruits, and insects, and are generally seen on the ground. *Saurothera vetula* is the type of the sub-family, and is called *Tacco* in Jamaica, from its cry. It forms its own nest, and rears its young itself. It lives upon small reptiles, is easily tamed, and hops like a magpie.—The coucals, *Coccyzinæ*, have short elevated bills, compressed towards the tip, short round wings and long tarsi. They are seen generally on the ground, running about with quickness among reeds and grass, and feeding principally upon grasshoppers, lizards, and fruit. The Senegal cuckoo, *Centropus ægyptius*, is rather larger than our common cuckoo, and perches upon the lower branches of trees, flying badly, and only short distances at a time. It is common in the mountainous districts of Abyssinia, sitting in the thick caper and thorny bushes, whence it

is difficult to drive it. The horn-bill cuckoos, *Crotophaginæ*, have a short, more or less compressed bill, with a naked space round the eyes. They are found in America and the West Indies. See CROTOPHAGA.

Cuculinæ. See CUCULIDÆ.

Cucullæa (*cucullus*, a cowl).—A genus of molluscous animals belonging to the class *Conchifera*, and family *Arcadæ*. This genus is distinguished from *Arca* by having in addition to the series of teeth placed along the hinge edge of the shell, a series on each side parallel with the hinge line at each end. The shells are inequivalve, and generally pretty large. The living species are few in number, only one or two being known; but many exist in a fossil state, not fewer than 100 different species having been described.

Cuculus. *The Cuckoo.*—See CUCULIDÆ.

Cucumis. *The Cucumber.*—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*, and containing several species of considerable importance to man. The fruit in them all is pulpy internally, and many seeded. The cucumber, *C. sativus*, is supposed to be originally a native of Tartary, but no traveller seems actually to have seen it growing wild. It is now cultivated in almost every part of the civilized world. When very young, it forms what is called the gerkin, so well known as a pickle. The melon, or musk melon, *C. melo*, is probably originally a native of Cashmere, but its true native country is not exactly known. The melon is much cultivated now in various parts of Europe, and many varieties are reared. It is esteemed one of our most delicious summer fruits, and is peculiarly refreshing in hot climates. In France it is also used as a sauce for boiled beef. In India a species is much cultivated, and forms one of the most useful cucumbers known. This species, *C. utilissimus*, grows very much like the common cucumber, and is used by the natives in a variety of ways—when young, as a pickle—when ripe, as a fruit. The seeds, dried, are ground into meal, and employed as an article of diet, and when crushed they yield a mild oil, which is mixed with their food, and burned in their lamps. The water melon, *C. citrullus*, is generally considered to be the melon of the Jews, mentioned in many parts of the Bible, and is extensively cultivated in most hot countries, where it is very much used and highly esteemed. Though of little estimation in the north of Europe, it is a valuable fruit in Egypt, where, to the natives, it serves both as food, drink, and physic. The *Colocynth*, so much used as a purgative medicine, used formerly to be considered a species of this genus, but is now referred to the genus CITRULLUS, which see. Some fossils nearly related to this genus are found in the Isle of Sheppy, and have been called *Cucumites*.

Cucurbita. *The Gourd.*—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*, and containing various species, well known and much used. The large gourd, *C. maxima*, is a common plant; and there are many varieties, but their native country is unknown. The squash gourd, *C. melopepo*, is a useful plant in long voyages, as it can be kept in a fresh state for several months, and is either made into pies, or boiled and eaten with meat. The pumpkin, *C. Pepo*, is a native of the Levant, and is much used in various parts of the world as an article of food. It is used on the continent in soups, and stewed or fried in oil or butter. Pumpkin pie is a favourite dish in many parts of the world, and when thus cooked, with lime juice as a sauce, it can scarcely be distinguished from apples. This fruit is sometimes not less than thirty lbs. weight. The vegetable marrow, *C. ovifera*, is originally a native of Astracan, but is successfully cultivated in this country. It forms one of our most delicate vegetables, the flesh having a peculiar tenderness and softness, from which circumstance it derives its name. The bottle gourd, *C. lagenaria*, is a musky scented plant, and is a native of America, Egypt, and Amboina. The fruit is shaped like a bottle, and is sometimes nearly six feet long. In Egypt the poor people eat it boiled with vinegar, or they fill the shell with rice and meat, making it into a kind of pudding. The outer skin is hard, almost woody when dry, and is converted into drinking cups, bottles, and other domestic utensils, for the use of the lower orders of people. The pulp, however, is said sometimes to be poisonous.

Cucurbitaceæ.—A nat. ord. of dicotyledonous plants, consisting of herbaceous plants with succulent stems, climbing by means of lateral tendrils. The genera are about sixty in number, and at least 300 species are known. They are natives of warm climates chiefly, and abound in India. A certain degree of acridity pervades the order, and many of the plants are drastic purgatives—see CITRULLUS, which contains the *Colocynth*, and MOMORDICA, one of the species of which is the *Elaterium*. In some cases, however, the fruits, especially under cultivation, are eatable—see CUCUMIS and CUCURBITA, amongst the species of which are the *Melon*, *Cucumber*, *Pumpkin*, and *Vegetable Marrow*, &c. In some the bitter principle is highly concentrated, and renders the plants extremely dangerous. See BRYONIA. The seeds of some of the species yield oil, and are even ground into a kind of meal. See CUCUMIS.

Culex. *The Gnat genus.*—See CULICIDÆ.

Culicidæ. *The Gnat family.*—A family of dipterous insects belonging to the section *Nemocera*, and characterized by possessing a long slender rostrum half the length of the insect, and a sucker containing five sharp, fine pointed, needle-like organs, forming an apparatus, the delicacy of which is unrivalled. The type of the family is the genus *Culex*, and the common gnat, *C. pipiens*, is the typical species of the genus. These little insects are excessively troublesome and vexatious, and the punctures made by

their sucking apparatus are often attended with considerable swelling and uneasiness. This apparatus, however, only exists in the females. Gnats do not show themselves much during the day, except in thick woods and damp places, but they issue in swarms in the evening, dancing in the rays of the setting sun, and producing with their wings a loud humming noise. They deposit their eggs upon any substance floating on the surface of the water, pools, and ditches, &c. The larvæ are hatched at the end of two days, and live in the water, breathing by means of a spiracle situated at the end of a long tube arising from the end of the abdomen. They have several generations in the year, and the numbers produced are immense, but happily they are kept under by birds and fishes devouring them. Troublesome as gnats are in this country, their annoyance is nothing compared with that of the mosquitos in hot climates. These insects, though they are known in different parts of the world by the common name mosquito, are in reality different species. The common mosquito of the United States and West Indies, is the *C. mosquito*, and a Brazilian species has been described under the name of *C. molestus*. What renders the sting of the gnat and mosquito so annoying, according to most authors, is that the proboscis is able to inject an irritating fluid into the wound, as well as suck up the blood. The great irritation, however, may be accounted for, from the length of the needle-like proboscis. Travellers in America, India, and even some of the parts of northern Europe in summer, describe the sufferings endured from these pests as intolerable.

Cuminum.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and containing one species, *C. cyminum*, the cumin, which is a native of Egypt and Syria, but much cultivated in Sicily and Malta for the sake of the seeds. These have an aromatic, warm, and bitterish taste, and a strong but not disagreeable smell. They contain a large quantity of essential oil, and are believed to possess carminative and stomachic qualities. In the north of Europe and Germany, the people mix them with their bread to give it an aromatic flavour, and the Dutch use it for the same purpose in their cheese.

Cummingtonite.—A mineral composed of silica, protoxides of iron and manganese, and soda, of a silky lustre, in the form of greyish-white, slightly diverging needles, and found in mica slate at Cummington in Massachusetts.

Cunoniceæ.—A sub-order of saxifrages. See SAXIFRAGACEÆ.

Cuphus.—A synonym of SEPTARIA.

Cupressineæ. *The Cypress tribe.*—A sub-order of dicotyledonous plants belonging to the nat. ord. *Coniferæ*, characterized by having the ovules erect, and the fruit an indurated cone, or fleshy with the scales connected, forming what is called a *galbulus*. The genus *Cupressus* is the type of the family, the species of which are distinguished from the firs and pines by their leaves being mere scales, the cones formed of a small number of peltate woody bracts, and the seeds being very small, angular, and several to each bract. The species have a peculiar habit and appearance by which they are readily known. The common cypress, *Cupressus sempervirens*, is a large evergreen tree, with hard compact wood, of a pleasant smell, and very durable. Pliny mentions that in his time there were trees growing at Rome older than the city itself. The gates of St. Peter's Church at Rome, made of cypress, are said to have lasted from the time of Constantine, 1,100 years, as fresh as new, when Pope Eugenius IV. ordered gates of brass in their stead. In the time of Thucydides, the Greeks used this wood for making coffins for their eminent warriors, and many of the chests which enclose the Egyptian mummies are made of it. It is supposed to be the gopher-wood of the Bible. The cypress is a native of the Levant, south of Italy, some parts of the Russian empire, and China, but it is now cultivated as an ornamental tree in all the warmer parts of Europe. From its deep green branches and leaves, and its gloomy air, it has always been chosen, even from ancient times, as a memorial of the dead, and forms at the present time one of the principal ornaments of cemeteries in Greece, and throughout the Ottoman empire. The spreading cypress, *C. horizontalis*, is a handsome species, forming a beautiful object with its graceful spreading branches loaded with large round cones. The deciduous cypress, *C. disticha*, is one of the largest trees of America, growing sometimes seventy feet high with a girth of thirty feet. It grows in ground covered with water three or four feet deep, and is one of the few resinous trees which flourish in such situations. The leaves are deciduous and the wood is light, fine grained, and very durable. Hence it is much used in America for various kinds of carpentry work, and is particularly excellent for shingles.

Cupressites.—A name given to those fossil plants which resemble in their aspect the living genera, belonging to the *Cupressineæ*. The branches of some species have been discovered in the tertiary formations, distinguished by having leaves, opposite or in whirls, sessile, short, and subulate, but as the fruits have not as yet been found, botanists are prevented from determining whether they belong to the genera *Cupressus*, *Thuja*, or *Juniperus*. Others have been discovered with alternate leaves, the fruit of which has been found, and which enables it to be referred to the genus *Taxodium*—whilst others still, found in the copper mines of Frankenberg, appear to belong to the genus *Cryptomeria*.

Cupressus. *The Cypress Tree.*—See CUPRESSINEÆ.

Cupuliferæ (*cupula*, a little cup; *fero*, to carry).—A synonym of the nat. ord. of plants CORYLACEÆ.

Curare.—A vegetable poison, the effects of which are such as to produce almost instantaneously fatal effects. It is prepared and used by the Indians of tropical America, of which country the tree from which it is obtained is a native. The plant appears to be a species of the genus *Strychnos*, called *Mavacure* by the natives, and resembles very much, if it is not exactly the same as the woorara, or wourali poison of the same locality. Endlicher says it is prepared from the *Strychnos guianensis* and *S. toxifera*, mixed with pepper, the berries of *Menispermum*, and other plants. Its active principle is an alkaloid, and called by chemists *Curarine*.

Curculio. *The Weevil genus.* — See CURCULIONIDÆ.

Curculionidæ.—A family of insects belonging to the pseudotetramerous section of *Coleoptera* and group *Rhyncophora*. It is one of the most numerous and natural of the families of beetles. The species are all distinguished by their head being prolonged into a more or less elongated snout or beak, in some being longer than the entire body, whilst in others it is shorter and thick. The body is generally of an oval or rounded form, and narrowed in front; and the structure of their cushioned tarsi show them to be formed more for adhering and creeping upon stems and leaves, than for walking on a plane surface. Many of them are wingless, their elytra being soldered together, and as a means of defence, nature has provided them with very hard integuments. There are exceptions to these characters in some of the genera, as in BRENTHUS, in which the body instead of being squat and short is linear and elongated, and in *Orchestes*, which is enabled to escape its enemies by leaping great distances. Some of the genera, as *Entimus*, contain species remarkable for their splendid colours, being covered with scales of gold upon a green ground, or scales of silver upon a ground of azure. The diamond beetle, *Entimus nobilis*, is a splendid insect, a native of South America, and its elytra form beautiful objects for the microscope, their splendour being then seen to be caused by minute scales like those on the wings of butterflies. They vary very much in size, from the *Calandra heros*, which is three inches long, to the *Apion fulvipes*, which is scarcely one line in length. The insects belonging to this family are entirely herbivorous, [redacted] feeding upon leaves, others upon seeds, and [redacted]on the stems of vegetables. The larvæ [redacted]f them are extremely injurious to corn [redacted]minous plants, and are pre-eminently [redacted]eevils." See CALANDRA and BRU-[redacted]Others live in the interior of ripe nuts. [redacted]INUS. Some are very injurious to [redacted]the *Anthonomus pomorum*, for instance, [redacted] the apple blossom and destroying it. [redacted]truction is sometimes committed upon [redacted]rds in Herefordshire, by either this or a closely allied species. Some of the species feed upon the parenchyma of leaves, which they roll up in form of a horn to conceal themselves. See RYNCHITES. Others live in the interior of galls which they form, and others again live in the interior of the wood of trees, to which they often do much damage. It is said there exist upwards of 10,000 species of curculionidæ in different collections, of which about 4,000 have been described. Upwards of 400 are natives of Great Britain. The family *Curculionidæ* corresponds with the old Linnæan genus *Curculio*, but from the multiplicity of named groups into which that original genus has been separated, it is now sunk altogether, instead of being retained to distinguish one of them.

Curcuma. — A genus of monocotyledonous plants belonging to the nat. ord. *Zingiberaceæ*, and containing about thirty species. They are elegant plants without stems and with tuberous roots, and are natives of the Old World, being chiefly found in the moist woods of India, Java, and China. The rhizomes or root stocks of most of these plants possess the stimulant or colouring principles common to the rest of the family. The best known species is the common turmeric, *C. longa*, which is extensively cultivated in India, and much used as a condiment, and for dyeing. The root has an acrid and slightly bitter taste and a penetrating colour. In powder it is used medicinally as an aromatic carminative, and as a condiment it enters largely into the composition of curry powder. It also furnishes a beautiful orange or lemon tint, which is used as a dye, but unfortunately is fugacious. Chemists and perfumers employ it for colouring pomades. A considerable quantity is imported into this country, the imports from places eastward of the Cape, amounting in 1852 to 1,252 tons, of which 683 tons were re-exported. The colouring principle is called *Curcumine*. The zedoary, *C. Zerumbet*, and the broad leaved turmeric, *C. Zedoaria*, both natives of Asia, are used by the inhabitants as a stimulating condiment, a medicine, and a perfume. The tubers are aromatic, and their sensible properties are like those of ginger, but not so powerful. From the tubers of *C. rubescens*, which are pearl-coloured inside and are aromatic when bruised, a considerable quantity of starch is obtained, which is used by the natives for preparing arrow root, and in Travancore forms the principal part of their diet.

Cursorinæ.—A sub-family of birds. See CHARADRIIDÆ.

Cursorius (*cursor*, a runner).—*The Coursers.* See CHARADRIIDÆ.

Cuscus. — A genus of kangaroos. See MACROPIDÆ.

Cuscuta. *The Dodder.*—A genus of plants. See CONVOLVULACEÆ.

Cuscuteæ. *The Dodder family.*—See CONVOLVULACEÆ.

Cyamus. *The Whale Louse.*—A genus of parasitic crustacea. See LÆMODIPODA.

Cyanœa.—A genus of acalephous animals. See MEDUSA.

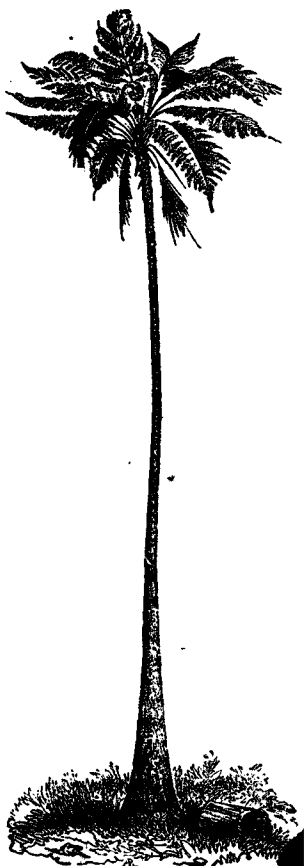
Cyathea (*κυαθος*, a cup). — A genus of acotyledonous plants belonging to the division *Thallogena*, nat. ord. *Filices*, and sub-order *Polypodieæ*. This genus contains what are called the tree ferns. The species are of an arborescent form, with stems straight and sometimes lofty. They are most abundant, and most highly developed in tropical countries, and are remarkable for the large bipinnate or tripinnate

Zamia pungens.

fronds, giving a peculiar character to the vegetation of the districts where they grow. The most common species is the common tree fern, *C. arborea*, which is a native of the West India islands and Brazil. About forty species have been enumerated, the greater number being natives of the West Indies, Mexico, and South America. Two are found in Africa, and about eleven in India, the islands of the Pacific, and New Zealand. The annexed figure represents the tree fern of the East Indies, *Alsophila Perrotetiana*.

Cyathocrinus.—A genus of fossil echinodermatous animals. See CRINOIDEÆ.

Cycadaceæ. *The Cycas family.* — A nat. ord. of dicotyledonous plants, belonging to the gymnospermous group of the sub-class *Monochlamydeæ*. The species contained in this family have simple stems, long, straight, and cylindrical, and marked with the scars of the leaves. They are terminated by a cluster of large pinnated leaves, giving them very much the appearance of palms. The internal structure of the stems and leaves, however, is more or less distinctly that of dicotyledonous plants, and the microscopic structure of the wood, and the mode of fertilization of the ovules place them close to the *Coniferæ*. There are several genera, and the species are found in the temperate and warm regions of America and Asia, as well as at the Cape of Good Hope. The cellular tissue forming the parenchyma is filled with an abundant supply of starch, which is of great use to man, and the seeds of some are as much esteemed as chestnuts, and equally used as food. The genus *Cycas*



Alsophila Perrotetiana.

gives the name to the family, but co
a few species, two of which are well
revoluta, a native of Japan, and *C.*
Asia. Both of these trees, as we
species of *Zamia* natives of the West
Bahamas, yield a species of sago whic
much used by the natives of the coun

they grow, but which does not reach this country. Our figure represents the zamia pungens. Undoubted fossil remains of *Cycadeous* plants, in the lias, wealden, and other formations of England, attest the fact of their once having formed a part of the vegetation of Great Britain.

Cychnoches.—A genus of orchideous plants. See ORCHIDACEÆ.

Cyclamen (*κυκλος*, a circle).—A genus of dicotyledonous plants belonging to the nat. ord. *Primulaceæ*. The species of this genus are natives of Central and Southern Europe and Northern Africa. They are much esteemed—the elegance of their flowers and the beauty of their leaves making them great favourites in the garden. The common cyclamen, *C. Europæum*, is a native of Sicily, where the wild boars prefer it to any other kind of food. Hence it is known by the name of sow bread. It possesses violent purgative properties, and has been used in cases of intestinal worms and as an emmenagogue. The acrid principle of the root has been separated, and is known by the name of *Arthanatine* or *Cyclamine*. One of the peculiarities of this genus is, that the flowers are seated on a twisted pedicel, which, when the flowers fade, turn round and round till they bury the capsule which they bear in the earth. In this position the seeds ripen and germinate, and produce other plants.

Cyclas (*κυκλος*, orbicular). — A genus of small fresh water *Mollusca* belonging to the family *Cyrenidæ*. The species are tolerably numerous, and are natives for the most part of colder climates than some others of the family. The young are hatched in the internal branchiæ, are few in number, and very unequal in size. The genus cyclas is now divided into two, *Cyclas* and *Pisidium*, and of these about thirty species have been found recent, and thirty-five fossil from the wealden.

Cyclica (*κυκλος*, a circle).—A division of phytophagous *Coleoptera*, so named from the rounded form of the body of the greater number of the insects belonging to it. They are generally of small or moderate size, and ornamented with brilliant metallic colours. The larvæ are all hexapod, and like the perfect insects subsist upon the leaves of a variety of plants. Their habits are various, some concealing themselves beneath an excrementitious covering, see CASSIDA: others residing in tubes which they carry about with them, see CRYPTOCEPHALUS: some being naked and exposed, see CHRYSOMELIDÆ: and others again are concealed in the interior of leaves upon the parenchyma of which they feed, see HALTICA. The insects belonging to the section *Cyclica*, are divided into three families, CASSIDIDÆ, GALERUCIDÆ, and CHRYSOMELIDÆ.

Cyclocephalæi.—A family of monsters belonging to the order *Autosites*. They are characterized by the nose and eyes being imperfect. The former is sometimes atrophied or reduced to a proboscis of mere skin, and the latter are either rudimentary and imperfect, or the two are joined into one in the centre of the face. Cases of this sort are not common in the human race, occurring more frequently in dogs, cats, pigs, &c., &c., and what is rather curious, nearly three-fourths of the cases are females. It was no doubt the occurrence of some cases of this monstrosity in man amongst the ancients, that gave rise to the fable of the Cyclops. Creatures however with this sort of malformation generally die soon after birth.

Cyclometopa (*κυκλος*, a circle; *μετωπον*, front).—A group of crustaceous animals. See BRACHYURA.

Cyclopidæ (*κυκλος*, circle; *ωψ*, eye).—A family of entomostracous *Crustacea* belonging to the order *Copepoda*, and of which the genus cyclops is the type. The animals of the genus cyclops, as originally constituted, though all agreeing in general form, vary in so many particulars amongst themselves, that it has become necessary to divide them into a number of genera, and indeed into several families. They are very small, are exceedingly abundant, and occur in myriads both in sea and fresh water. They are remarkable for their fertility. One impregnation suffices for the life of the female, during which she may produce from eight to ten families, and from forty to fifty young at each birth. Jurine has calculated that in the case of the *C. quadricornis*, a single female may at the end of summer have become the progenitor of the amazing number of 4,442,189,120 young! They undergo a considerable number of changes in their progress from youth to maturity, as, when first born, they are very unlike their parent. Their shell or carapace is thrown off and renewed frequently during their life. They have the power of enduring a considerable degree of drought and cold without suffering death. The species inhabiting this country are few in number, but in warmer climates they appear to be exceedingly numerous, and the marine species are remarkable for being in a great measure the cause of the luminosity of the sea. The common water flea, *Cyclops quadricornis*, is the most abundant perhaps of all our native entomostraca, and may be found in myriads in all our fresh water ponds and ditches. The *Diaptomus castor* is the most elegant of the British species, and is characterized by the possession of very long antennæ. The *Cetochilus* forms, in the arctic regions and in the Southern Ocean, the chief food of the whale. Their numbers are said to exceed all power of calculation. The *Sapphirinæ* are found in the seas to the southward, and are remarkable amongst all their congeners for the vivid luminousness they produce at night in the water of the ocean. The *Harpactidæ* are marine species, and some of them are very abundant on our coasts. They formed till lately part of the genus cyclops.

Cyclops. (The name of the attendants on Vulcan.)—See CYCLOPIDÆ.

Cyclopteris.—A genus of fossil ferns, remarkable for the size and orbicular or oval shape of the leaflets. They are found in the coal measures and oolites.

Cyclopteridæ (*κυκλος*, a circle; *πτερυξ*, a wing).—A family of fishes belonging to the order *Acanthopterygii*, and known by the general name of suckers. Their ventral fins are united together into a disc, by which they are enabled to attach themselves to marine bodies. Their skin is slimy and naked, or with hard grains imbedded in it. They live in shallow water, near coasts, and swim with great vivacity. In some arrangements this family receives the name of *Discoboli*, and is made a subordinate group of the family *Gobiidæ*. The lump sucker, or cockpaidle of the Scotch fishermen, *Cyclopterus lumpus*, is a British species, and common in the seas about the Orkneys. Before the spawning season it is of a brilliant crimson colour, mingled with orange, purple, and blue, but afterwards changes to a dull blue or lead colour. It is a large bodied fish, but the sucker is so powerful, that a pail of water has been lifted up by a person taking hold of the tail of an individual adhering to the bottom. The genus *Lepadogaster* contains a number of species; small fishes with two discs on the under surface of their bodies, the one formed by the pectoral, the other by the ventral fins, by means of which they adhere to stones, rocks, and shells. Their bodies are often painted with the most brilliant and defined colonrs.

Cyclopterus.—See CYCLOPTERIDÆ.

Cyclostomata.—A family of fishes. Synonymous with PETROMYZIDÆ, which see.

Cyclostomidæ.—A family of operculated land shells belonging to the pulmoniferous *Gasteropoda*. The animals of this family respire air in the same manner as the ordinary pulmoniferous mollusca, and live upon dry land. They have in consequence been generally classed near the *Helicidæ* or snail shells, but of late naturalists have been returning to the opinion of Cuvier, who placed them in his arrangement next the genus turbo. The organization of the animals brings them closer to the *Littorinæ* or periwinkles, than to the *Helices*, and accordingly they are placed next to that genus in some of the latest methods. The family contains numerous species, many of them of great beauty, and most of them natives of warm climates, as India, the Philippine islands, &c. Some fossil species occur in the tertiary formations.

Cydippe.—A genus of animals of the class *Acalephæ*. See BEROE.

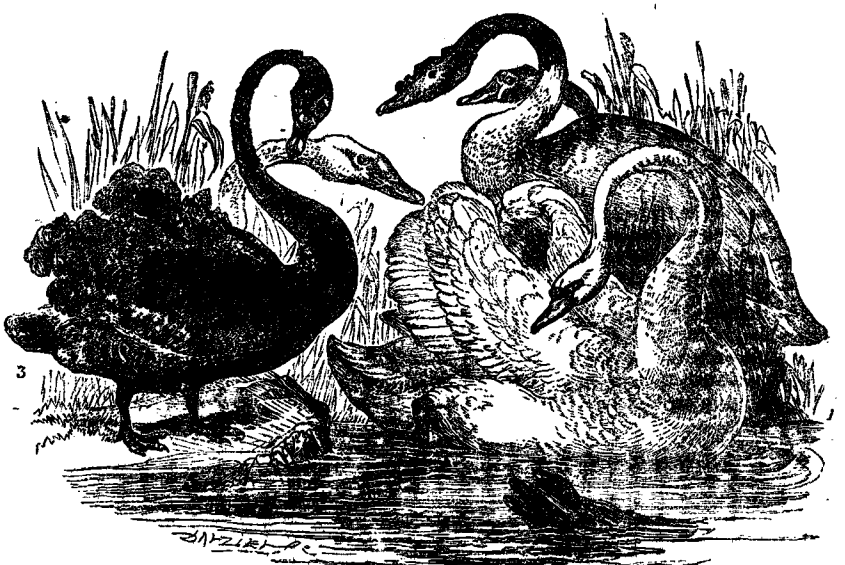
Cydonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*, sub-order *Pomeæ*, containing several species which are small trees with large flowers and pulpy fruits. The quince, *C. vulgaris*, is the best known species, originally a native of Asia Minor but now naturalized in Europe. It has a tortuous stem, oval leaves, white and cottony underneath, and grows about seven or eight feet high. The flowers are large and handsome, white with a little rose colour, and the fruit is large and fleshy, with an austere taste, but a peculiar fragrance. Several varieties are cultivated; one especially for grafting pears upon, and another for its fruit, of which jellies and conserves are made. The seeds yield a great deal of mucilage, and generally occur in large irregular shaped masses adhering to each other. One part of these seeds will render forty to fifty parts of water so mucilaginous, that it will possess the thickness of syrup. Perfumers and hair dressers prepare a mucilage from them for smoothing and fixing the hair, which they call *bandoline*. It is used also as a lotion on the continent in inflammation of the eyes, and is especially applicable to the faces of those who suffer from the cold winds of winter and spring.

Cygninæ. *The Swan family.*—A sub-family of web-footed birds belonging to the large family *Anatidæ*, and order *Anseres*. They are characterized by having the head small, the beak higher than broad at the base, and of equal breadth throughout, short legs, and the hind toe small, and not lobed. The mandibles are furnished along the sides with transverse serrated lamellæ, and the upper one is terminated by a strong horny curved nail. The eyes are small, placed near the beak; the leg half naked, feet broadly webbed, wings sharpish and concave, a nearly square tail, and a massive body with a neck nearly equal to it in length. This neck consists of twenty-three vertebræ. In some of the species the sternum or breast bone is hollow, and serves to lodge the trachea which forms a double convolution before entering the lung. In strength and size the swans are at the head of all aquatic birds, and though of the general form of the goose and duck, are possessed of a grace and elegance much superior to them when seen in the water. On land, however, they are awkward and stupid. The swan is the favourite of the poets, and has been praised by them more than it deserves, its real nature being cruel and mischievous. At the time of pairing, the males attack each other with great fierceness, and severe combats often ensue, and the females when attending their young attack every one that approaches them. They fly heavily, and generally slowly, but rise to a great height, and observers say that the sound of the pinions of the wild swan when flying is very harmonious to hear. Swans are generally of a white colour, but those of New Holland are black. Though awkward when walking, in consequence of their legs being placed behind the centre of equilibrium of the body, and heavy in flight, the movements of the swan in the water are graceful in the extreme. When nothing excites them, they move with

majestic slowness, their long arched neck towering above the surface of the water;

"The swan with arched neck
Between her white wings mantling, proudly rows
Her state with oary feet."

but when roused by anger or other passions, their course is exceedingly rapid. They take great pride in keeping their plumage clean. Sacred to Apollo, the swan has been celebrated as the bird of the Muses in almost all languages, and its melodious note is proverbial. This, however, is a mere fable, as the cry is loud and harsh, and when heard at a distance, as when a flock is sailing along high up in the air, it sounds like a trumpet. Swans feed on roots, leaves, seeds, frogs, leeches, and all sorts of aquatic insects, and it is said they even eat small fish. Their nests are large, and composed of herbs, &c., placed near the edge of the water. They lay from five to eight eggs, which they sit upon for six weeks. Some of the species are migratory birds. The wild swans which visit this country leave in autumn, and fly in flocks arranged in the form of a wedge. They fly close to each other, and when they go down the wind their rapidity is excessive, in a brisk gale flying 100 miles an hour, but when flying against the wind, their motion is slow. The northern regions of the world appear to be the chief abode of the swan family, and our domestic swan comes originally from the extensive marshes found in the centre of the vast forests of Prussia and Poland. Seven or eight species are known, most of them belonging to the genus *Cygnus*, which is the type of the family. The tame swan, or mute swan, *Cygnus mansuetus*, or *Olor*, appears to be the swan of the ancients, as may be seen from antique cameos and pictures. They made it the model of whiteness and grace, they esteemed it the bird of love, and in their representations it was always attached to the car of Venus—nor did they refuse to eat it, as a swan was generally served up with great ostentation at their public feasts. A cygnet even at the present day is not despised, and cooked with proper gravy, it is said to be delicious, tasting something between goose and hare. In this country this species forms a great ornament to gentlemen's private grounds where there is much water, and in former days was considered a royal bird. In 1841 there were 437 swans on the Thames;



1. *Cygnus mansuetus*—The Mute Swan. 2. *C. nigricollis*—Black-necked Swan. 3. *Chenopis atrata*—The Black Swan. 4. *C. otoriferus*—Whistling Swan.

232 belonging to the Queen, 105 to the Company of the Dyers, and 100 to the Company of Vintners. They are marked by a particular cut or *nick* on the upper mandible, and on the first Monday of every August these marks are reviewed by the *swan-uppers* or *swan-hoppers*, as they are generally called. The male swan is called a *Cob*, and the female a *Pen*. They are said to be very long-lived birds, and individuals are known to have lived fifty and even seventy years, though a much longer period has been assigned them. It is believed that swans are singularly

prescient of a coming flood, and it has been observed that they have raised their nests to a considerable height, before the storm of rain has come on. The wild swan, elk, hooper, or whistling swan, *Cygnus* (*Olor*) *ferus*, is a winter visitor to the British islands, but its native haunts are the northern regions of Europe and Asia. It occasionally breeds in captivity, and may be sometimes seen half domesticated on ornamented pieces of water. The black swan, *Cygnus* (*Chenopis*) *atrata*, is a native exclusively of New Holland and Van Diemen's Land; is in form not unlike the swans of Europe, but the plumage is black, only relieved by a little white on the primary and secondary quills, and the bright red mandible. It is of rather a mild disposition, and is very adroit in eluding its pursuers. When shot or killed, its dying note is said to be "like the creaking of a rusty sign on a windy day." Several other species exist in America, and the trumpeter swan, *Cygnus buccinator*, a native of the northern portions of the New World, is the chief source from which we obtain our *swan's down*, so much esteemed for its fineness, and employed in the manufacture of ladies' muffs and tippets.

Cygnopsis.—A genus of web-footed birds. See ANSERES.

Cymbium.—A genus of shells. See VOLUTIDÆ.

Cymbulia (κυμβα, a boat.)—A genus of molluscous animals belonging to the class *Pteropoda*. Two or three species are known, the animals being oblong, gelatinous, and transparent, and the shell cartilaginous and in the form of a slipper. They are found in the Atlantic, Mediterranean, and Indian Oceans.

Cyminum.—A synonym of the genus CUMINUM.

Cymophane.—A synonym of CHRYSOBERYL.

Cymothoa.—A genus of crustacea. See ISOPODA.

Cynanchum.—A genus of plants. See ASCLEPIADACEÆ.

Cynara.—See CYNARACEÆ.

Cynaraceæ or **Cynarocephalæ.**—A suborder of dicotyledonous plants belonging to the nat. ord. *Compositæ*, including several genera and many species, though it is not by any means so large a family as the others belonging to this order. The flowers in these plants are all tubular, and the involucre is hard, conical, and often spiny. The plants themselves are usually tonic and stimulant, and the bitterness which belongs generally to the order is in them much lessened by cultivation, so that they become esculent. The typical genus, and which gives its name to the family, is the genus *Cynara*, containing the two well known plants, the artichoke and cardoon. *Cynara Scolymus*, the common artichoke, is a native of the south of Europe, but is now cultivated in our gardens as a vegetable. The receptacles or bottoms may be preserved for winter use, by drying them after having blanched them in boiling water. The root of the artichoke is rather bitter, and was at one time used as a diuretic. *Cynara carduncellus*, the cardoon, is a native of the south of Europe and north of Africa, and is, like the artichoke, cultivated as an esculent vegetable. It has thick fleshy leaves, with prominent ribs, and it is the rib or middle nerve of the leaf that is eaten. They are blanched, and, when cooked, are tender, and resemble the artichoke in flavour. For some of the other plants belonging to this sub-order, see CARLINA, CARDUUS, CARTHAMUS, CENTAUREA, CNICUS, &c.

Cynictis.—A genus of animals belonging to the class *Mammalia*, order *Feræ*, and family *Viverridæ*, characterized by having five toes on the fore feet, and four on those behind, long falcate claws adapted for digging, and the tail long and bushy. Only one species is known, the meer-kat, *C. Levaillantii*, which is a native of the Cape of Good Hope. In general colour and external appearance, it strongly resembles a small fox. It lives in burrows on the dry plains on the eastern confines of the colony, and is not very often met with.

Cynipidæ. *The Gall Flies.*—A family of hymenopterous insects, containing numerous species of small size, and which are to be found in most parts of the world. They are particularly interesting, from the fact of the females possessing a peculiarly formed ovipositor, which is rolled up spirally, and lodged in a canal in the abdomen. With this instrument they slightly puncture the stems and leaves, &c., of various plants, and in each puncture deposit an egg. The irritation produced by the wound in the substance of the plant, causes an increased flow of sap there, which nourishes the young larva as soon as it is excluded, the continued presence of which excites still farther the flow of sap, till a protuberance is produced, growing in size as the larva grows. These protuberances are called *galls*, some of which are considerable articles of commerce. The different species of *Cynipidæ* establish themselves upon particular trees, and the galls thus produced are various in appearance and form. The larvæ undergo their changes in these substances, and when full grown quit their place of abode by a small hole made through its substance. The genus *Cynips* is the type of the family, and the most important galls are produced by species of this genus. The galls of commerce are found on the *Quercus infectoria*, a species of oak growing in the Levant, and are produced by the *Cynips Gallæ tinctorum*. They are about the size of a boy's marble, round and hard, with little tubercles on their surface, and contain only one larva in each. When gathered before the insects quit them, they contain more astringent matter, and are then known as black, blue, or green galls. When the insects have escaped, they are less

astringent, and are called white galls. They are of great importance in the arts, being very extensively used in dyeing, and in the manufacture of ink. They are the most powerful of all the vegetable astringents, and are sometimes used with great effect in medicine. Those imported from Syria are the most esteemed, and of these, those found in the neighbourhood of Mosul are considered the best. *Cynips insana*, another species of the genus, produces, upon the same kind of tree, a gall which has given rise to great controversy amongst Oriental scholars and Biblical commentators. It is found on low oaks, growing on the borders of the Dead Sea, and is as large as an apple. These are the celebrated "Dead Sea fruits," often called *Poma insana* or mad apples, *Mala Sodomitica*, &c. A curious kind of gall is found on the rose trees, and is known by the name of bedeguar. They are large and hairy, of a green colour, and somewhat of the size and appearance of a medlar. The surface is composed of an immense number of fibrous filaments, close set, but with the extremities free. These galls are inhabited by a number of larvæ.

Cynocephalus (κυων, dog; κεφαλη, head.) *The Baboons* or *Dog-faced Apes*.—A genus of quadrumanous animals belonging to the family *Simiidæ*, and containing several well known species, as the baboon, mandrill, &c. The species are generally easily distinguished from the rest of the family by the great prolongation of the face and jaws, and by the truncated form of the muzzle like that of the dog. They are of considerable size, the male being usually larger than the female, and in form and appearance are disgustingly ugly. Their limbs are strong and vigorous, the hinder one being only a little larger than the anterior. The face is variously coloured in different species, and their small eyes deeply sunk beneath huge projecting eyebrows, their low contracted forehead, and the diminutive size of the cranium compared with the enormous development of their face and jaws, give them a fierce and malicious look. The facial angle is only from 30° to 35°. The cheek pouches are remarkably large, and the teeth are of the same number and proportion as in man. The tail in some of the species is very long, and in others very short, and the callosities on the hips are of considerable size. When young, these animals are docile, and even show affection for their keepers, but as soon as they become full grown, all this changes, they become intractable and incorrigible, and seem only to live to be troublesome. Threats of punishment and even blows, produce no effect. The species are almost entirely confined to the continent of Africa, and in their wild state they prefer as places of abode small hills with scattered rocks and bushes. They live in troops, and defend their abodes against all intruders. If a man make his appearance, they utter loud cries, and if these do not deter him from advancing, they throw stones, branches of trees, and even their excrement at him. Their ordinary food consists of vegetables, such as berries and bulbous roots, &c., but in the vicinity of human habitations, they are very destructive in the fields and gardens. They sally forth at night on their marauding expeditions, and take every precaution not to be surprised. Some of the species of this genus were known to the ancients, and figures of them are found on the old paintings of the Egyptians. One of the most common species is the chacma, *C. porcarius*, a native of the Cape of Good Hope, and when full grown, equal in size and superior in strength to the mastiff. It lives in troops of ten, twenty, or thirty individuals, frequenting the mountains, and rarely entering woods. It is still to be found on the Table Mountain, and at night pays occasional visits to the gardens at the base. It is said to be capable of being domesticated, and travellers say it may be made as docile as a dog. The blacksmith teaches it to blow his bellows at the forge, and the waggon driver commits to it the care of his team! The Hottentots will not touch anything as food that the chacma refuses to taste, as they have a great opinion of its exquisite senses of taste and smell. The derrias, *C. hamadryas*, is the species which was known to the ancients, and which is found represented on Egyptian monuments, and embalmed as mummies. It is a native of Arabia and Abyssinia, the Arabians calling it *Robah* or *Robba*, and the Abyssinians, *Derrias*, *Tot*, or *Tota*. In ancient times the natives of these countries held this baboon in great veneration, and divine honours were paid to it. The common baboon, *C. Papio*, is the species most commonly seen in itinerant collections, in the streets, and in museums. It is a strong, stout built creature, gentle in youth, but fierce and morose when grown up. It inhabits the coast of Guinea. These species are possessed of elongated tails, but there are two which have them very short, and which have been separated by some naturalists, and placed in a distinct genus, *Papio*. The mandrill, *P. Maimon*, is a native of Guinea, and is remarkable for the enormous protuberances of its cheeks, formed of an erectile tissue, which in the adult are ridged and marked with bright and variegated colours, while the nose becomes of a scarlet hue. It is the largest of all the baboons, measuring above five feet when standing upright, and in a state of nature is a truly formidable animal. When domesticated, it has been observed to have a strong taste for spirituous and fermented liquors.

Cynogale (κυων, a dog; γαλη, cat).—A remarkable genus of animals belonging to the class *Mammalia*, order *Ferœ*, and family *Viverridæ*. Only one species, *C. Bennettii*, is known, a native of Borneo, Malacca, and Sumatra. It is the most aquatic of all the family, its soft fur resembling that of the otter, and its semi-retractile

claws being partially webbed. The legs are rather short, the head is depressed, and the eyes are high up and close set. It prefers damp places and rivers to dwell in, and like the otter seeks its food there, which consists chiefly of fish.

Cynomorium.—A genus of rhizantheous plants. See BALANOPHORACEÆ.

Cynosurus (*κυων*, a dog; *ουρα*, a tail). *Dog's Tail Grass.*—A genus of grasses, one species of which, *C. cristatus*, the crested dog's tail, is exceedingly abundant in all natural and artificial grass land in this country. It does not produce much hay, but is admirably adapted for permanent pastures, and sheep are said to be less affected by the "foot rot" when fed on land containing a large portion of this grass.

Cynthia.—A genus of molluscous animals belonging to the class TUNICATA, which see.

Cyperaceæ. *The Sedge family.*—A nat. ord. of plants belonging to the class *Monocotyledones*, and sub-class *Glumaceæ*. The species belonging to this family are herbaceous plants with fibrous roots, and a solid, jointless, creeping, often angular stem. They have the appearance of grasses, and the determination of the species is very difficult. Their geographical distribution is very extensive, being found under all climates. In the cold parts of the northern hemisphere they almost equal the grasses in number. The greater proportion prefer moist meadows and elevated regions. They contain only a small quantity of starch and sugar, their stems and leaves are so dry as to render them of little use as food for cattle, and their seeds cannot be converted into meal. The roots, however, of some species contain a certain quantity of starch associated commonly with a bitter principle and an aromatic oil which has caused them to be employed as diluents, diaphoretics, and diuretics. This is a numerous family, consisting of 112 genera, and upwards of 2,000 species, and has been subdivided into several tribes. The genus *Cyperus* which gives its name to the order is the type. The tubercular roots of some of the species are possessed of tonic and stimulating properties, and in some others the starch which they contain is united with a thick oil. One species, a native of the West Indies, *Cyperus hydra*, when it unfortunately gets introduced into the sugar plantations, completely ruins them, rendering the whole plantation barren. The roots of *Cyperus esculentus* are possessed of a saccharine quality and an agreeable taste; and this plant is cultivated in France for making emulsions and sherbet. The cellular tissue of *Cyperus papyrus*, or *Papyrus antiquorum*, the papyrus of the Nile, is used in the manufacture of paper, and the plant called in the Bible the bulrush, is perhaps the same plant, or one closely allied to it. The fibrous roots of some of the species of the genus *Carex*, were at one time substituted for sarsaparilla, and even now are used to adulterate it. The genus *Eriophorum* is remarkable for the silky or cottony substance which clothes the fruit, and gives to the species the name of cotton grass. They grow in marshy heaths and wastes in many parts of this country, and are easily known by the long cottony tufts which wave upon their stalks. This substance is sometimes used for stuffing pillows and making wicks for candles. The roots of some of the species are said to possess the power of expelling the tape worm and stopping diarrhœa. In Scotland and the north of England, it is said, sheep are remarkably fond of these plants, and the shepherds affirm that they possess wonderful powers for nourishing the sickly ones of the flock.

Cyperus.—A genus of plants. See CYPERACEÆ.

Cypræa. *Cowry.*—See CYPRÆIDÆ.

Cypræidæ. *The Cowry family.*—A family of gasteropodous *Mollusca*, containing many shells of great beauty and value. The shell is convolute, enamelled, and has the spire concealed. In the young state it is thin, covered with a delicate periostraca, and has a wide mouth, and the animal has the mantle expanded on each side into lobes. As they approach the adult age, these lobes spread out so as to cover the back of the shell, while the mouth of the shell is gradually contracted and inflexed, only leaving a narrow slit. These lobes of the mantle deposit a fine coat of enamel over the whole surface, which in most of the species is highly polished. The species abound in both the Old and New World, but attain their greatest development in hot climates. They are littoral and are generally found on reefs, or under stones, or rolled corals. Upwards of 200 species are known, distributed in several genera. The genus *Cyprœa* alone, contains 150, and is the type of the family. Many of the species are exceedingly beautiful, and some being very rare as well, command high prices. The orange cowry, *Cyprœa Aurora*, which in the Friendly Islands is worn as an ornament by persons of the highest rank, *Cyprœa princeps*, *C. umbilicata*, *C. guttata*, and several others, are estimated by collectors at from £10 to £40 a-piece. The little *C. annulis*, a native of the Eastern Seas, is used by the natives of the Indian Archipelago to adorn their dress, to weight their fishing nets, and for barter, and, curiously enough, specimens of it were found by Layard in the ruins of Nimroud. The money cowry, *C. moneta*, a native of the Pacific and Eastern Seas, is used as money in Hindostan and many parts of Africa. They are chiefly brought from the Maldives, and are an article of trade at Bombay. Many tons weight are annually imported to this country, and again exported for barter with the native tribes of Western Africa. In the year 1848, sixty tons were imported into Liverpool, and in 1849, nearly 300 tons were brought to the same port.

Only one species of the genus is found in Great Britain, belonging to the sub-genus *Trivia* or pig shell. In this genus the shell is not so highly polished, and the surface is ribbed across. In Italy these shells are called *Porcelli*, and the name of *Porcellain* which is often given to cowries in general, is taken from the fancied resemblance of these shells to pigs, the name by which they are known on the coast. The genus *Ovulum* is known by the name of the poached egg, and contains a number of species which vary considerably in shape, some being large, globular, smooth, and of a milky whiteness, whilst others are spindle-shaped, being much produced at both ends, or are shaped like a weaver's shuttle, and variously coloured. A number of species, amounting to seventy-eight, are found fossil in the chalk and tertiary formations.

Cypricardia.—A genus of bivalve mollusca belonging to the order *Goniopoda*. The recent species are not numerous, but about sixty are found fossil. They live in crevices of rocks and corals, and are found in the Red Sea, India, and Australia. The species of the sub-genus *Coralliophaga*, bury themselves in calcareous masses, or in madrepores, in holes which they either make for themselves, or which they find ready made by species of *Lithodomus*.

Cyprididæ. A family of entomostracous *Crustacea*, belonging to the order *Ostracoda*. The species are natives of fresh or sea water, are very small, and are enclosed in a horny-cretaceous covering of two valves exactly resembling a minute mussel shell. They do not undergo any change in their progress from youth to maturity, but when first born, resemble their parent. The eggs are not numerous, and are deposited by the mother on plants or similar objects, where they remain fixed for four or five days, till the young are hatched. In their progress to maturity they repeatedly moult or change their shell. They are carnivorous, preying upon dead animal matter, and they can bear a considerable degree of drought without perishing, whilst the eggs are capable of being hatched after the drought has killed the adult animals. The recent species are tolerably numerous, and many fossil species occur, especially in the chalk. The genus *Cypris* is the type of the family, and all the species are natives of fresh water. The genus *Cythere* inhabits, with one or two exceptions, the water of the sea; and the species of *Cypridina* are exclusively marine.

Cypridina.—A genus of entomostraca. See CYPRIDIDÆ.

Cyprina.—A genus of bivalve *Mollusca* belonging to the family *Veneridæ*, and containing only one recent species, *C. Islandica*, which is a large shell, a native of the Northern Seas, ranging from Greenland and the United States to the Icy Sea, Norway, and England, and living in from five to eighty fathoms water. Not fewer than ninety species are found fossil.

Cyprinidæ. *The Carp family.*—A family of malacopterygious fishes belonging to the section *Abdominales*, containing a number of species, inhabiting fresh water, and spread over all parts of the world. They are distinguished by having a small mouth, in many destitute of teeth, a scaly body, and no adipose dorsal fin. They are most common in Asia and Europe; fewer are found in America, especially South America, and still fewer inhabit Africa. The family may be divided into two groups, those which have no teeth in the mouth, as *Cyprinus*, and those which have small teeth, as ANABLEPS. The carp, *Cyprinus carpio*, is the most common, and the most widely spread species of the whole family in Europe. Originally a native of Persia and the warm countries of Asia, it has been gradually introduced into all the countries of Europe, and appears to have made its first appearance in England between the fourteenth and fifteenth centuries. The old rhyme says, "Turkies, *carps*, hops, pickerel, and beer, came into England all in one year." The body is rather thick, and covered with large scales, and is of a more or less brilliant golden-green colour. The swimming bladder is very large, and the ovary in the female contains, it is said, 600,000 eggs. The palate is thick and fleshy, and is well known to gourmands as a delicate dish, under the name of carp tongues. The carp is said to be very long lived. At Fontainebleau it is asserted that some of the carps which were in the ponds there a few years ago were alive in the time of Francis I. At Charlottenbourg there are carps which are said to be 200 years old. They are not of great size in this country, one or two weighing from fifteen to nineteen pounds being about the largest on record; but in the Volga, specimens are taken of seventy pounds weight; and it is said that in the Lake of Como individuals have been taken weighing two hundred pounds! They are very tenacious of life, and may be carried great distances in wet moss. *Cyprinus auratus*, the gold-fish, is a native of China, but is now completely naturalized in England and other parts of Europe. It abounds in many streams in Portugal, from whence it is brought to this country for sale. Their colours are various, some being marked with blue, brown, or silver; but the most general colour is bright gold. The young fish are black, and they acquire their proper colour by degrees. The barbel, *Barbus vulgaris*, is common in this country in deep ponds and sluggish rivers, which have little or no current. It lives on aquatic plants and roots, boring into the banks with its snout like a hog. The flesh is coarse and unsavoury, but it affords capital sport to anglers. The binny, or barbel of the Nile, a common fish in that river, is a much better tasted fish, though it is so like our common barbel that it is difficult to distinguish between them. It grows to about seventy pounds weight, and affords good food to the natives. The gudgeons, *Gobio*, belong also to this family.

Gobio fluviatilis, the common gudgeon, is a small fish, from six to eight inches long, and common in the streams of England. They swim together in shoals, feeding on worms, aquatic insects, and larvæ, small molluscs, &c., and afford ample amusement to anglers. It is a well flavoured fish. The tench, *Tinca vulgaris*, is a common European fish, and is more or less abundant in the ornamental waters and ponds of this country. Like the carp, it is very tenacious of life, and its flesh is much esteemed. The bream, *Abramis brama*, is another species of the carp family, found in lakes and the deepest parts of still rivers. It grows to two feet or two and a-half in length; but it is a coarse tasted and insipid fish. The ova in the female bream is stated to be 130,000. The genus *Leuciscus* contains several well known fish, as the bleak, chub, dace, roach, &c. See LEUCISCUS. The loach belongs to this family also. See COBITIS.

Cyprinus. *The Carp.*—See CYPRINIDÆ.

Cypripedium. *The Slipper Plants.*—A genus of *Monocotyledonous* plants belonging to the nat. ord. *Orchidaceæ*, containing several species of herbaceous plants, growing in the colder and temperate parts of the northern hemisphere, and common in America. The roots are fibrous, the stems foliaceous, and the flowers are large and remarkable. From the concave form of the labellum or lip of the flower, they have been called *Slippers*. They are much esteemed by horticulturists for the beauty and bizarre form of their flowers. About twenty species have been described, one of which, *C. calceolus*, or lady's slipper, has been found, though very rarely, growing in England.

Cypris.—A genus of entomostraca. See CYPRIDIDÆ.

Cypselus.—A genus of birds. See HIRUNDINIDÆ.

Cyrena.—A genus of bivalve *Mollusca*, consisting of fresh water shells, thick, solid, and pretty large, and covered with a smooth, horny, or scaly epidermis. They are all natives of warm climates, living in the mud of rivers and in mangrove swamps, usually near the coast. Twenty-five recent species have been described, and about seventy fossil.

Cyrtoceras.—A genus of fossil cephalopodous mollusca. See NAUTILIDÆ.

Cyrtodactylus.—A genus of reptiles. See GECKOTIDÆ.

Cystica (*κυστις*, a bladder).—An order of *Entozoa* or intestinal worms, containing those species the body of which is terminated by an hydatid vesicle. See CYSTICERCUS, CŒNURUS, and ENTOZOA.

Cysticercus (*κυστις*, a bladder; *κερκος*, a tail).—A genus of intestinal worms belonging to the order *Cystica*, and of very simple organization. The body is short, and terminated posteriorly by a vesicular dilatation, filled with a liquid. The head is distinct, and the mouth is surrounded with two crowns of very sharp hooks. They are chiefly found in man, or the quadrumana, but occur also in bats, moles, mice, hares, and pigs, &c., living in the brain or the cellular tissue, the lungs, liver, peritoneum, &c. In man, when they are found in the brain, they are the cause of intellectual derangement; and when they occur in the pig, which they do occasionally in great numbers, they produce the disease called *measles*. Late researches have apparently proved that the different species of *Cysticerci* are only young *tæniæ*, or tape worms. They exist in the simple form of a *Cystic worm* as long as they remain in the tissues where they are developed; but when they happen to pass into the digestive canal, they then assume the form of true tæniæ. Eggs of a tænia, voided by a human being, were given, along with its food, to a pig, and in five months afterwards, upon examining the muscles, a great number of completely developed *Cysticerci* were found in them. The cysticerci, again, which inhabit hares and rabbits, were given to dogs to swallow; and these animals, having been killed at different periods afterwards, the cystic worms were found in the intestines undergoing a regular change to the state of tape worms.

Cystopus.—A genus of thallogenous plants belonging to the nat. order *Fungi*, of which the "white rust," common on cabbages and other cruciferous plants, is a good example. This plant, *C. candidus* (*Uredo candida*), appears in white pustules, eventually bursting and destroying the epidermis of the leaves, stalks, flowers, and seed-vessels of the infected plants, and producing great distortion in their growth.

Cytherœa (*κυθερεια*, a name of *Venus*).—A genus of bivalve mollusca belonging to the family *Veneridæ*, and containing a good many recent species, several of them of great beauty. *C. lusoria*, a native of China, is used by the Chinese and Japanese in certain games, and the interior is painted by them of various colours. A good many species occur fossil.

Cythere.—A genus of entomostraca. See CYPRIDIDÆ.

Cytherina.—A genus of fossil crustacea. See TRILOBITE.

Cytherinidæ.—A family of fossil crustacea. See TRILOBITE.

Cytinaceæ.—A family of glumaceous monocotylędonous plants belonging to the nat. ord. *Rhizanthèæ*, and living parasitic upon the roots of other plants. They are either stemless, or they have a very short, fleshy stem covered with imbricated scales, which are only abortive leaves. The typical species of the family is *Cytinus Hypocistis*, a parasite on the roots of certain kinds of *Cistus*, in the south of France, and is said to contain gallic acid. The *Hydnora* is parasitic upon the euphorbiaceæ of the Cape of Good Hope.

Cytisus.—A genus of dicotyledonous plants, belonging to the papilionaceous tribe of the nat.

ord. *Leguminosæ*, and containing several species, which are small trees or shrubs, natives of the southern and mountainous regions of Europe and Asia. About thirty species are known, of which the common laburnum, *C. Laburnum*, may be taken as the type. Indigenous to the Alps and the heights of Jura, it is now extensively cultivated in our gardens and shrubberies. Its bunches of long, pendulous, yellow flowers, are very ornamental, and its wood is hard and valuable, susceptible of taking a high polish, which makes it sought after by turners. The seeds are bitter and poisonous; but hares and rabbits are particularly fond of the leaves and bark, and will touch no other tree as long as a twig of laburnum remains. The common broom is by some botanists made a species of this genus. See SPARTIUM.

Cytharia.—A genus of fungi. See THALLOGENÆ.

D

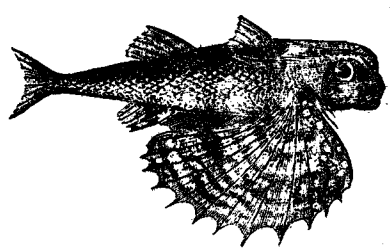
Dacelo.—A genus of birds belonging to the fissirostral tribe of the order *Passeres*, and forming part of the family *Alcedinidæ*, or kingfishers. The species are peculiar to Australia and its islands, inhabiting desert regions, which they traverse in search of snakes and other reptiles, upon which they feed. The giant kingfisher, *D. gigantea*, is the largest species of the whole family, measuring eighteen inches from the tip of the bill to the end of the tail. Its plumage is olive-brown, with pale blue-green, and it has a remarkably loud, grating, and prolonged cry.

Dacnis.—A genus of birds belonging to the tenuirostral tribe, of the order *Passeres*, and forming part of the family *Promeropidæ* or *Nectariniidæ*, the sun birds. The species are natives of Mexico, and the type is *D. Cayana*, a pretty little bird, with a plumage of cerulean blue on the body, and black on the forehead, shoulders, wings, and tail. It is called elotototl by the Mexicans, and is considered by them as good for eating.

Dacrydium (δακρυ, a tear; υδος, form).—A genus of dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Taxineæ*, and composed of a small number of species, growing in India and New Zealand. They are evergreen trees, of considerable size, and their wood furnishes the natives with valuable timber. A species of resin flows from the stems, dropping in the form of tears, a circumstance which has given its name to the genus. *D. taxifolium*, a native of New Zealand, grows to the height of 200 feet, and from its branches is manufactured a beverage resembling in antiscorbutic qualities the well known spruce beer. The most curious species, however, is *D. colensoi*, which grows in the northern part of the same island. It is very rare, and much venerated by the natives, who believe that it is concealed from them by one of their gods, on account of its great value. When they happen to meet with one they preserve it, in order to hollow it out as a place of sepulture for their chiefs, believing it to be almost indestructible.

Dactylis.—A genus of monocotyledonous plants belonging to the sub-class *Glumaceæ*, nat. ord. *Gramineæ*, and tribe *Festucaceæ*. The type of the genus is the common cock's foot or fox's foot grass, *D. glomerata*, a grass which is very abundant in the meadows and waste places of the greater part of Europe. It grows two or three feet high, and though it is coarse and hard, it is readily eaten by cattle, horses, and sheep, and indeed forms a considerable part of the herbage of those pastures most celebrated for fattening and keeping the largest quantity of stock, in Devonshire, Lincolnshire, and the Vale of Aylesbury. The tussac grass of the Falkland Islands, *D. cæspitosa*, has of late years been introduced into this country, and thrives well in peaty soils, within the influence of the spray. It is five or six feet high, and very strong; but is nevertheless sufficiently delicate to be used as food for cattle. It promises to be a valuable grass in the Hebrides of Scotland.

Dactylopterus (δακτυλος, finger; πτερον, wing). *The Flying Gurnards.*—A genus of acanthopterygious fishes belonging to the family *Sclerogenidæ*, and allied closely to the *Triglidæ*, or gurnards. They are known at once from the true gurnards, by their having the sub-pectoral rays very long, and united together by a membrane, which gives them the character of wings, rather than fins. Their body is covered with hard, carinated scales. There are only two species known, one in the Mediterranean, and the other in the Indian Ocean. The Mediterranean



Dactylopterus volitans—Flying Gurnard.

species, *D. volitans*, is well known by the name of the flying gurnard, and is about a foot in length. By means of its large pectoral fins, which are of a blackish tint, mottled and spotted with blue, it is able to spring from the water when alarmed, and sustain itself for a short time in the air. See EXOCÆTUS.

Dacus (δηξ, a worm which gnaws wood).—A genus of insects belonging to the order *Diptera*, and family *Muscidæ*. One of the species, and the type of the genus, is *D. Oleæ*, the larvæ of which are extremely injurious to the olive crop. They are of a whitish colour, the mouth furnished with two hooks, and they attack the fruit of the olive tree, gnaw their way into its very substance, and finish by completely devouring it. They are known to the natives of Provençe, in which province they sometimes commit great injury, by the name of *Chiron*.

Dahlia (after *Dahl*, a botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Corymbiferæ*, and consisting of three species, all natives of Mexico. The first individual of this genus was sent to Madrid, in 1789, from Mexico, and flowered for the first time in Europe, in 1791. Specimens of the roots were then sent to the gardens of different countries in Europe, and they are now extensively cultivated in all parts. Dahlias are great ornaments to our gardens, and for the beauty of their flowers are unrivalled in the autumn of the year. The parent stock is considered to be *D. variabilis*, but it is not quite certain, as *D. coccinea* and *D. Cervantesii* were formerly cultivated in our gardens as well, though the former, being the most beautiful, is the only one now seen in this country. In its wild state it is a bushy herbaceous plant, seven or eight feet high, and not remarkable for its beauty. By cultivation, however, it is readily improved in size and form, and sports into endless varieties. Experiments have been tried to ascertain whether the tuberous roots might be of use as food, but it would appear that they are not of any value as esculents for either man or beast.

Dalacia.—A genus of bivalve shells belonging to the family *Aviculidæ*, and only differing from *Crenatula* in the umbones of the shell being situated some distance from the front of the hinge margin, instead of being quite at the angle.

Dalbergia (after *Dalberg*, a Swedish botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, consisting of a number of species, which are either trees or climbing shrubs. The sissoo, *D. Sissoo*, is a forest tree, a native of India, and yields a valuable timber. From *D. monetaria*, a species of resin is obtained very similar to dragon's blood.

Dalea (after *Dale*, an English botanist).—A genus of dicotyledonous plants belonging to the papilionaceous tribe of the nat. ord. *Leguminosæ*. The species, of which about fifty are known, are herbs or shrubs, natives of North America, and covered with glandular points. The genus *Dahlia* was considered by some botanists so near in sound to this genus, *Dalea*, that the name of the former was proposed to be changed, and that of *Georgina* was given to it; a name, however, which has not been adopted.

Dama. *The Fallow Deer.*—See CERVINA.

Damalis.—A genus of antelopes. See ANTILOPEÆ.

Dammara.—A genus of gymnospermous dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Abietineæ*, the species of which yield a hard resin, called *Dammar*, from which it derives its name. The trees yield this substance in amazing quantity, exuding it through the bark spontaneously. The dammar pine, *D. alba* (*Agathis loranthifolia*), the *Pinus Dammara* of Linnæus, is a native of India and its islands, and its resin is exported in large quantities to Bengal and China, where it is used for all the purposes for which we use pitch, but principally for paying the bottoms of ships. Mixed with oil of turpentine, it forms an excellent varnish. The Kawrie pine, *D.* (*Agathis*) *australis*, a native of New Zealand, yields a resin called *Cowdie resin*, which is said to be extensively used as a varnish in America. The timber of these trees is light, and of inferior quality, though the straight, clean stem of the New Zealand species has caused it to be used for the masts of ships.

Danæeæ. *The Danæworts.*—A sub-order of acotyledonous plants belonging to the sub-class *Acrogenæ*, nat. ord. *Filices*, or ferns, and distinguished from the other sub-orders of the family by their spore cases being united in masses, not ringed, and opening irregularly by a central cleft. The species are all tropical, and are disposed in five genera, of which the genus *Danæa* is the type. One species, *Angiopteris erecta*, is employed by the Sandwich islanders to perfume their cocoanut oil; and the rhizome of a species of *Marattia* is used by them as food.

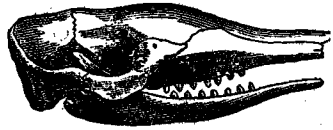
Daphne.—A genus of plants. See DAPHNEÆ.

Daphneæ.—A section of dicotyledonous plants belonging to the nat. ord. *Thymelæaceæ*, the type of which is the genus *Daphne*. There are a considerable number of species, most of them being shrubs, inhabiting the more temperate parts of Europe and Asia. Some of them are cultivated in our gardens for their beauty and fragrance; others are remarkable for their acrid and irritant qualities; and others again are useful in supplying a kind of hemp and paper. The mezereon, *Daphne Mezereum*, which has fragrant flowers that appear before the leaves, is in consequence a favourite in the garden; but the bark of the root and branches is a strong irritant poison, producing violent purging, and in a large dose even fatal consequences. Applied externally, it acts as a vesicant, and has sometimes been used instead of cantharides. The berries are also poisonous; and it is said that the Russian and Tartar women rub them on their cheeks, to produce the same effect, but more permanent, than rouge. Mezereon has been used medicinally in the form of decoction, as a diaphoretic, in cutaneous and syphilitic affections. It contains a neutral crystalline principle called *Daphnine*.

The barks of several other species of *Daphne* possess similar properties as that of the mezereon. *D. Pontica* is said to have been one of the plants which caused the poisonous quality of the honey eaten by Xenophon's soldiers during his famous retreat. A good yellow dye is obtained from the garou bush, *D. Gnidium*, a native of the south of Europe; and the bark of several species is so tough as to be made into ropes. That of *D. cannabina*, a native of China, is there used in the manufacture of paper; and the inner bark of *Lagetta lintearia*, when macerated in water, assumes a beautiful net-like appearance like fine lace, and has hence received the name of Lace-bark.

Daphnia (Δαφνι, a proper name).—A genus of entomostracous *Crustacea* belonging to and forming the type of the family *Daphniidæ*. The species are very abundant in fresh water ponds and ditches. They are generally very small, but occur in immense numbers; and being sometimes of a reddish colour, the mass swimming on the surface imparts a red hue to the water, as if it were tinged with blood. The body of the animal when at rest is contained within a carapace of two valves, permitting only the large antennæ to protrude externally. The females are very prolific, one impregnation sufficing for the animal's life, and for her descendants, for several successive generations. As many as six generations have thus been followed up in one season. The males are few in number, compared with the females. The eggs are of two kinds. One kind (varying in number from ten to forty or fifty) are deposited in an open space within the valves, between the back of the animal and the edge of the carapace, where they remain till the young are ready to be extruded. The other kind are deposited in a peculiar receptacle called the saddle (ephippium), which forms on the back of the carapace, and after a certain time is cast off. The eggs (generally two in number) remain floating in the water, in this saddle, till spring, when the young are hatched. When born, the young are of the same form as the parent; but as they increase in size they throw off the old shell, and receive a new one. This process of moulting takes place at intervals during the animal's life. The most common species in Great Britain is *D. pulex*. It occurs in almost every pool and is generally known by the name of *Water-flea*.

Dasypinæ. *The Armadillos*.—A family of animals belonging to the class *Mammalia*, order *Edentata* of Cuvier, *Dasypidæ* of Gray. There are a number of species, all natives of the warmer parts of South America, and called by the inhabitants of Guiana *Tattu*. They have no canine teeth, but they possess grinders. They walk on the soles of their feet with the claws expanded, and are remarkable for having their body covered with a shield, formed of rings of square pieces, three or more of the central rings being moveable. Notwithstanding this structure they are capable of varied and rapid motions, and are also able to roll themselves up in form of a ball. Being for the most part nocturnal animals, they live in burrows, which they can form very rapidly in the ground, and are thus able quickly to conceal themselves from the pursuit of their enemies. They are very strong, and in spite



Skull of Dasypus.

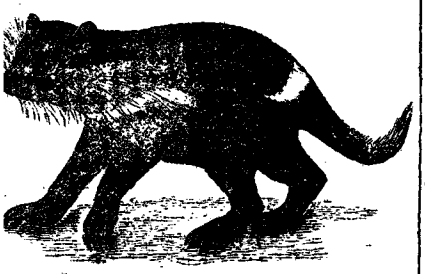
of their cumbrous-looking covering, and an appearance of corpulency, they can run swiftly, and easily outstrip a man. Their sight is very indifferent, but they have a very acute hearing and smell. Their chief food consists of fallen fruits, roots, and worms; but they also eat dead animal matter, abundance of which they find in the prairies. They are said to be excellent eating themselves, the hunters roasting them in their shells. The true armadillos, *Dasypus*, have the shields imbedded in the skin of the body with the central rings free, and the tails exserted. The *Chlamyphorus* has the shield all formed of moveable rings, and only fastened to the middle of the back, which is covered on the sides with soft fur. The tail is inflected.

Dasyprocta (δασυς, rough; πρωκτος, hind quarters). *The Agoutis*.—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Hystricidæ*. There are seven species described, most of which are natives of the West Indies, Guiana, and Brazil. The agoutis, *D. Aguti*, live on vegetables (though they will eat almost everything), and are very destructive to the sugar canes, of the roots of which they are very fond. They are very voracious, and when satisfied hide the remainder for another meal. When eating they sit upon their hind quarters, and hold their food between their fore paws. At the first settling of the West Indian islands they were exceedingly numerous, and constituted a great part of the food of the Indians; but they have been of late very much thinned by the planters, who destroy them in great numbers. They live in the woods, neither climb trees nor make burrows, but conceal themselves under fallen timber, or in some decayed tree, and appear to take the place, in South America, of the hare and rabbit of Europe. They produce young more than once a-year, and are very prolific. Their flesh is excellent eating, being white and tender, and when well cooked is a very palatable dish, and much esteemed by the natives.

Dasypus (δασυς, hairy; πους, a foot). *The Armadillo*.—See DASYPINÆ.

Dasyptilus.—A genus of cockatoos, a synonym of *Psittrichus*. See CACATUINÆ.

Dasyurinæ (δασυς, hairy; ουρα, a tail).—A sub-family of marsupial animals belonging to the family *Macropidæ*. The species are distinguished by having their feet like those of the dog, four pairs of incisive teeth in the upper jaw, and a bushy but not prehensile tail. They are all natives of Australia, are carnivorous, living by rapine, and are known to the natives by the names of wolf, tiger, hyæna, &c. They are nocturnal animals, and the females have all of them the abdominal pouch of the order. They have been subdivided into several genera, according to the number and disposition of their teeth, &c. The largest species is the Tasmanian or tiger wolf, *Thylacinus cynocephalus*, which is three feet and a-half in length, and is the most formidable and most ferocious of all the quadrupeds of New Holland. It dwells in the hollows of rocks, and preys upon small animals, poultry, &c. Since the introduction of sheep into the colony, it has shown a great predilection for mutton, and often makes great havoc amongst the flocks of the settlers. The ursine dasyure, *Dasyurus* (*Diabolus*)



Dasyurus (*Diabolus*) *ursinus*—Ursine Dasyure.

ursinus, is scarcely half the length of the preceding, and is called by the colonists of Van Diemen's Land, the *Devil*. It is about the size of the badger, but of a more sturdy and muscular form, and is of a black colour, with large ears and an obtuse muzzle. Of a wild, cruel, and ferocious disposition, it is as much dreaded by the natives as the thylacine itself, and is very destructive to the young lambs. The various species of *Dasyurus* proper have much of the same nature as the martins, pole cats, &c., of Europe, and are great enemies to the poultry yards. The species of *Phascogale*, or pouched mice, are small animals, as their name would infer, and differ from the preceding forms by having their teeth more of an insectivorous character. They live much upon trees.

Datiscaceæ. *The Datisca family.*—A nat. ord. *of dicotyledonous plants belonging to the* apetalous orders, and consisting of herbaceous branched plants or trees, with alternate exstipulate leaves. They are scattered over North America, various parts of Asia, and the southeastern part of Europe. Some of the species are bitter, and others have purgative qualities. *D. Cannabina* is the commonest, is a native of the southern parts of Europe, and in Candia is used as a substitute for Peruvian bark. It also affords a yellow dye.

Datura.—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and consisting of upwards of twenty species of herbaceous or shrubby plants, indigenous to America and tropical Asia, one species only being European. They are essentially poisonous plants, and generally exhale a narcotic odour from their leaves and flowers, which are frequently large and handsome. Two species have been introduced into Europe from Peru and Chili, *D. arborea* and *D. suaveolens*, and are cultivated in gardens for their beauty. They are tolerable sized arborescent plants, and exhale, especially in evening, a delicious odour, which becomes dangerous, however, to breathe for any length of time. The most poisonous, and also the most common species, is the thorn apple, *D. Stramonium*. This plant is by no means an uncommon annual in this country, growing upon dunghills, rubbish heaps, and waste places near houses; and is found spread over most parts of the world, with the exception, perhaps, of Australia. Under the name of stramonium, it has been used in medicine in cases of epilepsy and convulsions, and the leaves are often smoked like tobacco as a remedy for asthma. The seeds, reduced to powder, are used by thieves to mix with tobacco to stupify the victims whom they wish to rob. They are also employed to drug their beverage. In small doses it produces a sort of frenzy, with a burning thirst, and in larger quantities stupor and death. Strong emetics and copious acidulated drinks are the best remedies to be used in such cases. In the north of Europe, it is said, a "strong pinch" of the seeds are given, mixed with their food, to cattle, to make them fat. It creates a keen appetite, causes them to sleep long, and soon produces a great degree of fatness.

Daturine.—An alkaloid obtained from, and being the active principle of, stramonium.

Daucus.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and of which our common carrot, *D. carota*, is the most interesting species. The wild carrot grows in the meadows and pastures of Europe, the Crimea, and Caucasus, whence it has been transported to China, Cochin China, and America. It is considered to be the stock from which our garden carrot is derived, though we have no record when it began to be cultivated, and made to change its hard, wiry, juiceless root, for the nutritious succulent esculent we now have.

Decapoda (δικα, ten; πους, a foot).—An order of stalk-eyed *Crustacea*. See PODOPTHALMA. This order contains the greatest number of species of all the orders of the crustacea. The animals which belong to it are those which have the most complicated organization, and the most perfectly

developed faculties. The branchiæ, or gills, by which they respire, are fixed on the internal surface of the thorax, and are lodged in a cavity, formed by the prolongation of the carapace, beyond the sides. The head and thorax are compactly united or soldered together, and are covered by a large shield-shaped carapace, which stretches beyond the front of the body, descends on each side to the base of the feet, and extends backwards as far as to the origin of the abdomen. Their eyes, which are situated at the extremity of footstalks, often very long, are covered with a reticulated or facetted cornea. The organs of the mouth, in most instances, consist of a labrum or lip, a tongue, a pair of mandibles, two pairs of jaws, and three pairs of foot-jaws. The feet, properly so called, are five pairs; the first of which are transformed into arms, and are terminated by a pair of large claws or pincers, forming organs of prehension; the four other pairs being the true organs of motion. These animals are slow of growth, live long, and some of them become very large. The body of some species of thorny lobster, or *Palinurus*, sometimes exceeds three feet in length. Their claws are often very powerful. They ordinarily reside in the water, but some species live on land. They are generally carnivorous, are very voracious, and possess the power of restoring mutilated members. They change their shells at intervals, and some of those which are used as food, are preferred at such times as a delicacy for the table. The fact of the epidermis becoming bright red when boiled, as in the case of the lobster, is well known. The decapoda are divided into three large sections, distinguished from each other by the comparative length of the abdomen, or, as it is generally called, the tail. The BRACHYURA have short tails—as the crab. The MACROURA have the abdomen much developed, or are long tailed, as the lobster. A third set have the tails of an anomalous structure and variable length, the ANOMOURA, as the hermit crab. The greater number of fossil crustacea belonging to the *Malacostraca* are found amongst the *Decapoda*.

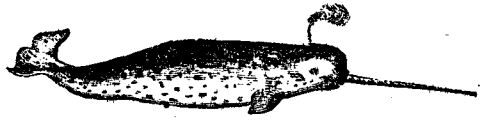
Decticus.—A genus of grasshoppers. See GRYLLIDÆ.

Degeeria.—A genus of insects belonging to the order *Thysanoura*, and family *Podurida*, and named after the illustrious Swedish naturalist, De Geer. The typical species is *D. nivalis*, a little creature, found living on the snow and on trunks of trees.

Deilephila (δειλη, twilight; φιλεω, to love).—A genus of insects belonging to the crepuscular *Lepidoptera*, and family *Sphingidæ*. This genus contains a number of species, all remarkable for the elegance of their form, and the more or less lively colours with which both the perfect insects and the larvæ are adorned. Some of the larvæ possess the power of elongating and contracting the three anterior segments of the body, giving them the appearance somewhat of the proboscis of an elephant, whence they have obtained in England the name of *elephant sphinxes*, and in France *chœnilles cochonnes*.

Delesseria.—A genus of acotyledonous plants belonging to the sub-class *Thallogenæ*, and nat. ord. *Algæ*, and named after Baron Delessert of Paris. It is one of the most beautiful genera of the family, and contains about a dozen species, which inhabit the temperate and warm zones of both hemispheres. The genus is seen in the polar seas, and goes on gradually increasing in number of species, till they reach the 35° of north latitude. They then begin gradually to decrease in number as they approach the equator.

Delphinidæ. *The Dolphins.*—A family of animals belonging to the class *Mammalia*, and order *Cete*. The dolphins generally have teeth in both jaws, and are readily distinguished from the other families of the order by their smaller and more proportionate head. They are a numerous family, are more carnivorous than the other cetaceans, and are the most ferocious of all the order. With the exception of two species, the *Inia Geoffroyii*, from the river Moxos in Upper Peru or Bolivia, and the *Platanista Gangetica*, the sou-sou of the Ganges, they are all marine. The bottle heads, *Hyperoodon*, are natives of the Northern seas, and are frequently seen on the



Monodon Monoceros—Narwhal or Sea Unicorn

British coasts. They have no teeth in the upper jaw. The narwhal, sea unicorn, or unicorn whale, *Monodon Monoceros*, has no teeth in the lower jaw, but has the upper jaw in the male armed with generally one though sometimes two very long, projecting, spirally twisted tusks. It is a native of the North Sea, and is sometimes seen on the coast of Scotland. It reaches the length of from twenty to thirty feet. The narwhal swims with great swiftness, and in the open sea they are often observed sporting about the ship in bands of twenty together, elevating their long tusks, and crossing them as if fencing. The use of this horn (which, as generally only one, and that the left, exists, has given the name *unicorn* to the species) has been supposed to be for piercing the ice, so as to enable the animal to respire without the necessity of retreating into open water, and for

spearing the fish which it feeds upon, as skate and turbot, &c., individuals of which have been found in its stomach. It is generally from six to ten feet long, and may also be intended as an organ of defence. The blubber of the narwhal yields a very superior oil, which, as well as the flesh, is considered a great delicacy by the Greenlander. The ivory of the tusks is exceedingly dense and hard, white, not subject to become yellow, and capable of taking a fine polish. It constitutes a valuable article of commerce; and the celebrated throne of the Danish kings is stated to be made of these tusks. The northern beluga, *Beluga Catodon*, the white whale and white fish of the whalers, is an inhabitant of the North Sea, abounding in Hudson's Bay, Davis' Straits, &c., and is an occasional visitant of the Scottish coasts. This species is of a white colour, and is seen in herds of forty or fifty, following the ships, tumbling about, and bespangling the surface with their brilliant whiteness. The oil obtained from their blubber is said to be good, and of a fine quality; and of their skin is made a sort of morocco leather, which, though thin, will resist a musket ball. The internal membranes are used for windows and bed curtains, and the sinews for thread; and the flesh is eaten, and said to resemble beef, though somewhat oily. The porpoise, or porpesse, *Phocæna communis* (derived from the Italian name for this animal, *porco pesce*, or hog fish), has numerous small sharp teeth in both jaws, and a dorsal fin in the middle of the body. It is the most common of all the cetaceans, and is found in almost all the European seas, and on the American coasts. It is about six feet in length, and is of a bluish-black colour on the back, and white underneath. The whole body is covered with a layer of fat nearly an inch in thickness, and the flesh beneath is red, and resembles that of the hog. Porpesses swim in shoals (or, as they are called by sailors, *schools*), and drive the mackarel, herrings, and salmon before them, as a pack of dogs do hares. They are well known to all who have been at sea, from their rolling or apparently tumbling motion in the water. They root about the shores with their snout in quest of food like hogs. Their flesh was formerly considered a great delicacy, and receipts for dressing it are to be found in ancient cookery books. The oil procured from the blubber is of the purest kind, and the skin, when carefully tanned and dressed, is used for wearing apparel, and for coverings for carriages. The Greenlander esteems the flesh of the porpesse as a great dainty, and quaffs the oil as the most delicious of draughts. A white species occurs in China. The *Grampus*, of which there are several species, is a native of the North Sea, and is often found on the coasts of Great Britain and France. The large grampus, *Orca gladiator*, is of such an extremely fierce and predaceous nature, that it not only destroys the porpesse and dolphin, but is reported to attack even whales. It measures from twenty to twenty-five feet in length. It is frequently seen in our seas, and is well known from its frequent blowing. The dolphins, *Delphinus*, are a numerous genus, twenty-two species having been described, inhabiting both the North and South Seas. The common dolphin, *Delphinus Delphis*, resembles very much the porpesse, and has been often confounded with it. It inhabits the Mediterranean and Indian Seas, swims swiftly, and preys upon fish. By ancient writers, the dolphin was celebrated for its supposed affection for the human race, and for the harmonious sounds of music. The fables connected with it are the poetic fictions of a classic age, and are totally opposed to the opinions of the moderns, who know it to be a predaceous animal, and consider its appearance at sea as the prelude of an approaching storm.—Several species of the genus *Delphinus* have been found fossil in the tertiary beds of Lombardy and France. Remains of one or two species of *Monodon* have also been found in Lombardy and the neighbourhood of London.

Delphinium. *The Larkspurs.*—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*, and consisting of annual or perennial herbaceous plants, with irregular spurred flowers, the colours of which are often of the most vivid blue. They are nearly related to the aconites, but do not possess the powerful qualities of these plants, with the exception of *D. Staphisagria*, or stavesacre, the seeds of which are irritant and narcotic, and are used for destroying vermin. The species abound in the temperate parts of the northern hemisphere, and many of them are cultivated in our gardens under the name of larkspurs.

Delphinula.—A genus of gasteropodous *Mollusca* belonging to the family *Trochidæ*. The species differ from the rest of the family in being thick, turbo-like, umbilicated, spinose shells, with a round mouth, but having the operculum horny, and many whirled. They are marine shells, with a nacreous interior, and inhabit the shores of warm climates. About twenty recent species are known, and nearly thirty fossil species have been described from the tertiary formations.

Delphinus. *The Dolphin.*—See DELPHINIDÆ.

Demodex.—A genus of parasitic animals. See ACARIDÆ. In addition to the species mentioned there, another has been found in dogs affected with the mange, which is perhaps identical, as it has been found that inoculating a dog with the human parasite, has produced in it a disease resembling, if not identical, with the mange.

Dendrobate (δένδρον, a tree; βαίνω, to walk).—A genus of batrachian reptiles belonging to the family *Bufonidæ*. The species are natives of America, and have the ends of their toes dilated like the tree frogs, and like them are able to climb trees. They have no teeth. It is generally believed by the natives that the blood of a species of this genus rubbed on the small

wounds on the bodies of green parrakeets caused by plucking out the feathers, gives to the new plumage of these birds a pretty mixture of red and yellow colours.

Dendrobium (*δενδρον*, a tree; *βιος*, life).—A genus of monocotyledonous plants belonging to the nat. ord. *Orchidaceæ*, and containing numerous species, which are all parasitic upon trees, and are found living in Asia and Australia. The flowers are often very large, and beautifully coloured.

Dendrocœla (*δενδρον*, a tree; *κοιλος*, intestine).—An order of annelides. See PLANARIA.

Dendromys (*δενδρον*, a tree; *μυς*, a mouse).—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Muridæ*. The only species, *D. typus*, is a native of South Africa, is about three and a-half inches long, with a tail four and a-half inches in length, and is found upon the branches of trees, where it builds its nest and brings forth its young.

Dendrophys.—A genus of serpents. See COLUBRIDÆ.

Dendropogon (*δενδρον*, a tree; *πωγων*, a beard).—A genus of mosses, which contains only one species, a native of Mexico, which is found hanging suspended from the trees to which it is fixed by one of its extremities. The stem is long and filiform, and pushes out laterally at right angles short branches, at the extremities of which are the fruit.

Dentalium (*dens*, a tooth). *Tooth Shells.*—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of the family *Dentalidæ*, and containing a number of species which inhabit Europe and the East and West Indies. The shells are symmetrical, tubular, conical, and generally curved. The anterior extremity is the largest, the aperture circular, not constricted, and the animal possesses an operculum. They are carnivorous animals devouring minute bivalves and foraminifera. They live at a slight depth in the sand or mud of the sea shore, and bury themselves in it perpendicularly, head downwards. Some species have a slit in the shell at the posterior or narrow extremity, forming the sub-genus *Entalis*. Till lately the tooth shells were regarded by naturalists as the tubes of worms. The fossil species are numerous, not fewer than seventy having been described from the Devonian strata.

Dentex (*dens*, a tooth).—A genus of acanthopterygious fishes belonging to the family *Sparidæ*, containing several species found living in shoals amongst the rocks, and much esteemed as affording excellent food. They are remarkable for having four long hooked teeth in the front of each jaw. The most common species, *D. vulgaris*, or four-toothed sparus, is very abundant in the Mediterranean, and is the *Dentex* of the Romans. It is of a silvery-blue colour on the back and grows to a large size, weighing from twenty to thirty lbs., and measuring three feet in length. It is a very voracious fish, and attacks other fishes of even superior size. In the Adriatic Sea it acquires a much larger size than in the Mediterranean; and in the estuaries of Dalmatia and the Levant the capture of this fish is an object of considerable importance, both as affording a good kind of food to the natives and as an article of commerce. Large quantities are exported, cut in pieces, and packed in barrels with vinegar and spices.

Deradelphus.—A genus of monsters. See MONOCEPHALII.

Dermanyssus (*δερμα*, the skin; *νυσσω*, to bite).—A genus of insects belonging to the class *Arachnida*, and family *Acaridæ*, living parasitic upon birds, mammalia, and reptiles. The typical species is *D. avium*, which is found at all seasons on the continent in the hollow canes which are used as perches in the cages of singing birds. In these they live in great numbers, and come out at night to attack the birds when asleep. Another species is found common on snakes kept in confinement. They fix themselves under the scales of the reptile, and as soon as they have satiated their hunger, they retire and hide in the coverings, which are kept along with the serpents in their cages.

Dermatine.—A mineral found in brown stalactitic masses in the serpentine quarry, near Waldheim, in Saxony. It is composed chiefly of silica, magnesia, and protoxide of iron.

Dermestes.—See DERMESTIDÆ.

Dermestidæ.—A family of insects belonging to the pentamerous tribe of *Coleoptera*, and consisting of several genera and many species found in Europe, Australia, Africa, and America. In their perfect state these insects are harmless creatures, living on flowers. The females deposit their eggs on animal substances, and the larvæ are particularly destructive to the collections of naturalists, and the skins in furriers' shops. These objects they destroy in great numbers unless peculiar care is taken to guard against their attacks. They are, however, unquestionably of great use to man in devouring dead animal matter, whole carcases being speedily converted by them into skeletons. They change their skin several times before they become pupæ. The genus *Dermestes* contains several species well known for the ravages they commit. Three species, *D. lardarius*, *vulpinus*, and *murinus*, are common in this country, and are chiefly found upon dried animal substances, such as hides, stuffed animals, bacon and hams, &c. Some years ago the ravages of *D. vulpinus* were so great in the skin warehouses of London, that a reward of £20,000 was offered for an available remedy. The larvæ of this same species are sometimes also destructive to cork, whole cargoes being occasionally almost completely destroyed by them. They have also been found in asbestos, perforating it in various directions, and undergoing their transformations there. Some other species have been found in

Egyptian mummies, and for others equally destructive, see ANTHRENIDÆ.

Dermoptera (*δερμα*, skin; *πτερον*, wing). *Dermopterous Fishes.*—An order of fishes, characterized by the possession of cutaneous vertical fins, in which the mucoid rays are extremely soft and delicate, or altogether imperceptible, and by the want of pectoral or ventral fins. The species are not numerous and are of a vermiform shape. Their skeleton is unossified, they possess no panereas, and the air bladder is wanting. This order is divided into three sub-orders, all the species belonging to which used formerly to be placed in the order *Chondropterygii*. From that order, however, they have been lately removed on account of their inferior organization. The first sub-order is the *Pharyngobranchii*, the fishes belonging to which have the pharynx organized for respiration, processes having the function of gills projecting from above the pharynx into the large cavity of the mouth. There being no lateral gill openings through the skin, the water necessary for respiration flows over these processes by the same canal which carries the food. They have no heart. This sub-order is represented by only one genus, *Amphioxus*, one species of which, the common lancelet, is found on the British coast. See AMPHIOXUS. In the second sub-order, the suckers, *Marsipobranchii* (or *Cylostomi* of some authors), the gills are fixed in the shape of little purse-like bags, varying in number, inoperculate, and receiving the streams of water for the purpose of respiration, by proper orifices in the pharynx, equal in number to the bags, each of them being distinct from the mouth. Thespecies belonging to this sub-order are of a vermiform shape and appearance, the vertical fins being folds of skin surrounding the tail, the rays of which are scarcely to be perceived in any part, being soft and rudimental. This sub-order is represented by the genera *Ammocœtes* or lance fish, *Myxine* or glutinous hag, and *Petromyzon* or the lampreys. See PETROMYZON. The third sub-order, the ribbon apodals, *Apodes Lemniscati*, have the gills free and sub-operculate. The species are delicate, semi-transparent, and scaleless fishes, of a ribbon-shape and much compressed. They are for the most part small, are found in all seas, and though not much known at present, will probably be found tolerably numerous. There is only one family, *Leptocephalidæ*, which contains five genera and about twenty-five species, several of which are found in the Mediterranean, and one is occasionally taken on the English coast. The genus *Leptocephalus* is the type of the family.

Desmidiaceæ. — A tribe of microscopic acotyledonous plants belonging to the nat. ord. *Algæ* and sub-order *Confervoidæ*. Many naturalists have considered them as animals and referred them to the infusoria. They are very minute, inhabit fresh water, and are chiefly found in clear pools in open exposed situations. When seen by the microscope they appear to consist of two symmetrical valves, having a notch or suture in the middle, showing the point of union. Their forms are very various, oval or round, entire or lobed, smooth or spiny, &c. They are covered by a membranous envelope, which is of an herbaceous green colour, and contains starch. Some authors assert that they are ciliated like the infusoria, and like them possess a voluntary motion. Many of them certainly have the faculty of fixing themselves to external objects, and enjoy a feeble power of locomotion, enabling them when mixed with mud to make their way to the surface, and in some instances even to retire beneath the surface of the mud in pools before this dries up. Their motion, however, chiefly consists in a mere propensity to direct themselves towards the light. When exposed to the light of the sun, these plants evolve oxygen. The desmidiaceæ are extremely numerous and are reproduced in several ways—by cell divisions, each cell dividing into t[illegible]—by ciliated active zoospores, and by conjugation. See CONJUGATION. They have been arranged in five tribes according to the shape and structure of the cells of which they are composed. 1, *Closterieæ*; 2, *Cosmarieæ*; 3, *Desmidieæ*; 4, *Ankistrodesmieæ*; and 5, *Pediastrieæ*. The genus *Closterium* has the cell crescent-shaped or arcuate, or much attenuated at the ends, and not constricted in the middle. The genus *Desmidium* has the cells united into an elongated jointed filament, which is triangular or quadrangular, and furnished with two opposite bidentate projections, very brittle and regularly twisted.

Desmidieæ.—See DESMIDIACEÆ.

Desmidium.—See DESMIDIACEÆ.

Dexiariæ.—A tribe of insects belonging to the brachocerous *Diptera*, and family *Muscidæ*. They are distinguished by having long legs and a lengthened abdomen, and appear to be viviparous, depositing their larvæ in the dung heaps or in putrid vegetables.

Dextrine. *Soluble Starch.*—A vegetable substance found in the interior of the cells of plants. The sap of all plants contains a certain quantity of it, and there seems every reason for believing that it is the source of the cellular matter of starch, sugar, gum, and other vegetable substances. It is almost as valuable to plants as protein is to animals, for it is a constituent from which their organism derives its most important products. Dextrine is artificially procured by adding 2 parts of nitric acid to 300 of water, and mixing this liquid with 1,000 parts of dry starch. This mixture is then subjected to heat, or it may be produced by treating starch with *diastase*. When thus obtained, dextrine is used under the name of gum substitute, soluble gum, &c., for thickening the colours in calico printing, and for making bandages for fractures. These starch bandages are often used in this country, being softened with warm water before being applied.

Diabolus.—A genus of marsupial animals. See DASYURUS.

Diacope (διακοπη, a notch).—A genus of acanthopterygious fishes belonging to the family *Percidæ*, and containing a number of large and beautiful species inhabiting the Indian seas.

Diadelphia.—The 17th class of plants in the Linnæan System, and nearly corresponding to the papilionaceous tribe of the nat. ord. *Leguminosæ*.

Diadora.—A genus of shells. See FISSURELLIDÆ.

Diamond.—See CARBON.

Dianæa.—A genus of animals belonging to the class *Acalephæ*, and order *Pulmograda*, and characterized by their having a hemispherical body furnished on the circumference with a small number of long tentaculiform cirrhi, excavated beneath and provided at its middle with a strong exserted proboscidiform appendage with four arm-like appendages at its extremity.

Dianthus. *The Pinks.*—A genus of plants. See CARYOPHYLLACEÆ.

Diaptomus.—A genus of entomostracous crustacea. See CYCLOPIDÆ.

Diaspore.—A hydrate of alumina, composed of alumina and water, and in some varieties combined with a certain quantity of oxide of iron. It occurs in greenish-gray plates with a pearly *lustre*, and in *doubly oblique* prisms. It is found at Koroibrod in the Orenbourg government of Asiatic Russia.

Diastase.—A substance formed during the germination of plants, but which can also be artificially procured by moistening pounded malt with an equal weight of water and pressing it through a bag. One part of this substance, so prepared, possesses the remarkable property of converting 2,000 parts of starch into dextrine, and 1,000 into sugar.

Diatoma.—A genus of *Diatomaceæ*, and giving the name to the family. This genus is characterized by the frustules being united by angles into flexuose chains, and possessing a peduncle by which the chains are affixed to submerged objects. Several species have been described, very small and forming a kind of slimy velvet coat on the surface of marine or fresh water plants.

Diatomaceæ.—A family or sub-order of microscopic acotyledonous plants belonging to the nat. ord. *Algæ*, and consisting of cells or frustules furnished with a coat of silica, which gives them a permanent nature. Each frustule consists of two usually symmetrical portions or valves very similar in appearance to a bivalve shell. These are very various in form, some circular, oblong, elliptical, or linear; others saddle-shaped, boat-shaped, undulate, or sigmoid, &c., and they are generally sculptured or marked with bands, lines, or dots. In some genera these valves are attached to foreign objects by a stalk or stipes, in others they are free, and many are capable of spontaneous motion, and may be seen slowly moving across the field of the microscope, or now and then suddenly darting forwards, sometimes receding, sometimes performing a rotatory movement on their axis. In consequence of this apparently spontaneous movement, these organisms have by many naturalists been considered animals, and classed with the infusoria. The contest among authors still continues as to their true position in the system of nature, though the supporters of their vegetable nature appear to be gaining ground. This motion is not peculiar to animals as the spores of many algæ, and their entire fronds are known to be actively motile. No true vibratile cilia have been found in the diatomaceæ, though there are some species which bear tufts of, or are fringed with, rigid cilia like those often seen at the ends of the filaments of oscillatoreæ, and which never exhibit any motion. These plants are abundant in all fresh, brackish, or salt water, sometimes forming a uniform yellowish-brown layer on the bottom of the water, at others adhering to various water plants, decayed stems, stones, &c., or scattered between the filaments of confervæ. They reproduce themselves either by self-division in the same way as other vegetable cells, or by conjugation in the same manner as the desmidiaceæ. Diatomaceæ often exist fossil, and they then form the fossil infusoria of geologists. They occur in vast numbers in aquatic and marine geological deposits, forming hills, rocks, and various strata. An immense plateau has lately been found at the bottom of the ocean between England and America, the construction of which appears to be entirely owing to these minute organisms. The greater part of the flinty substances known in the arts as *Tripoli*, and used for polishing metals, are almost entirely composed of diatomaceæ. The number of these bodies which existed at the epoch of the formation of the tripoli beds, must have been truly immense, as it is calculated that a cubic inch of this substance from Berlin in Bohemia for example, contains 41,000,000,000 of these little bodies. At Berlin, and elsewhere, there exists an argillaceous deposit so impregnated with these little organisms alive, that it possesses such mobility that no solid construction can be raised upon it. This deposit, however, affords a substance adapted for making bricks, so light as to float on the surface of the water. They occur in immense quantities also in peat beds, and in the guano brought from America and Africa, and in Norway they form what is known as the bergmehl. See BERGMEHL. The genera and species are exceedingly numerous, and they have in consequence been divided into several tribes. Some have the frustules transversely striated, and of these no fewer than eleven sub-families have been formed. Others have the frustules vittated, and these are arranged in three sub-families. A third tribe has the valves areolated or marked with cell-like markings, and of these, six sub-families are mentioned. To the first tribe belong the genera DIATOMA, FRAGILLARIA, BACILLARIA, SURIRELLA, and NAVICULA. To the second belong

STRIATELLA, ACTINOCYCLUS, BIDDULPHIA, and TRICERATIUM.

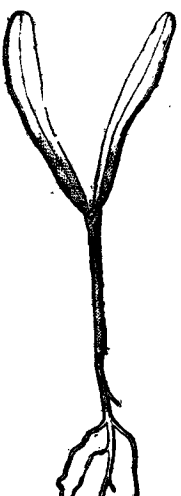
Dicæum.—A genus of birds. See NECTARINIDÆ.

Diceras (δίς, two; κέρας, a horn).—A genus of fossil bivalve *Mollusca* belonging to the family *Chamidæ*, and characterized by having very prominent beaks. The shells are large, very thick, and adhere to foreign bodies by one of their beaks. The species are few in number, and are found in the coral-oolite formation.

Dichlamydea (δίς, two; χλαμύς, a covering).—A term in botany. See COROLLA.

Dichroite. — A mineral substance. See IOLITE.

Dicotyledones (δίς, twice; κοτυλήδων, a seed lobe).—One of the two great divisions of the phanerogamous or vascular flowering plants, synonymous with the *Exogenæ* of Decandolle. In this division are contained all those plants the embryo of which has two opposite cotyledons or seed lobes, and are thus opposed to the mono-



Dicotyledonous embryo of *Acer Negundo*.

cotyledones. The dicotyledonous plants are much more numerous than the monocotyledonous, being in the proportion of eleven to two; and they constitute almost exclusively the arborescent scenery of all cold countries.

Dicotyles.—A genus of animals belonging to the class *Mammalia*; order *Pachydermata*, and family *Suidæ*. It contains two species, one of which, *D. torquatus*, is the collared pecari, or tajaçu. This animal is nearly allied to the pigs, and is about the size and has the appearance of a small hog. It is a gregarious animal, and lives in holes, in trees, or in the earth, in South America. The flesh is considered good eating and very tender. The other species, *D. labiatus*, was at one time considered only a variety of the preceding. It is, however, larger than the pecari, lives in solitary forests in South America, and in larger troops, and is hunted by the natives as an article of food.

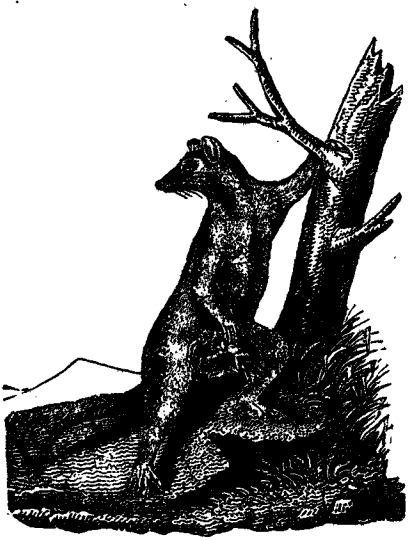
Dicranura (δίχρανος, forked; οὐρά, a tail).—A genus of insects belonging to the nocturnal *Lepidoptera*, and family *Bombycidæ*. In the perfect state these moths are not at all remarkable, being plain in form and colour. Their larvæ or caterpillars, however, are worthy of attention. They are large and thick anteriorly, slender and pointed posteriorly, and the last ring of the abdomen is divided into a double tail composed of two tubes, of a horny substance and roughened with two rows of spines, each containing, as in a sheath, a fleshy tentacle, which the creature can project at pleasure, and which it can elongate, shorten, fold back, and work in all directions. These organs serve as a means of defence against flies and ichneumons which attack these larvæ for the purpose of depositing their eggs in their back. As soon as the caterpillar feels the parasite, it elevates this double tail and darting out the two tentacles, directs them straight to the part attacked. In addition to this means of defence, they have on the neck a transverse slit, from which when irritated, they project four small tubercles which squirt out to some distance a very acrid liquid. This liquid is also used by them to soften and macerate the parings of the wood or the bark into which they enter for the purpose of assuming their pupa state, and at a later period for softening the part of the skin of this pupa case corresponding to the head of the moth, in order to facilitate its escape when ready to become a perfect insect. They are chiefly found upon willows and poplars.

Dicrurinæ.—A sub-family of birds belonging to the family *Laniidæ*. See EDOLIUS.

Dictamnus. — A genus of dicotyledonous plants belonging to the nat. ord. *Rutaceæ*. There are but few species, and the best known and most common is the fraxinella or false dittany, *D. Fraxinella*, a half-shrubby plant with a strong odour, and large elegant white or purple flowers in terminal racemes. The flowers and their pedicels are roughened with viscous glands, and it is from these that is exhaled the strong odour peculiar to the plant. This is owing to an essential oil contained in them, and it escapes in such quantity in hot and dry weather in summer as to take fire immediately a lighted candle is placed near the plant. Perfumers obtain from the flowers a very odorous distilled water much in request by ladies as a cosmetic.

Didelphidæ. *Opossums.* — A family of animals belonging to the class *Mammalia*, and

order *Marsupialia*. The typical genus, and which gives its name to the family, is *Didelphis*, the species of which are peculiar to America, and were the first marsupial animals known. They are characterized by having ten cutting teeth above, and eight below, and a tail, the end of which is naked, scaly, and prehensile. They are nocturnal animals, do not appear to possess much intelligence, and live on eggs, insects, and fruits. Some of them are about the size of our domestic cat, others are not larger than a mouse. They do not all possess the abdominal pouch so characteristic of the order, some of them having only a fold of skin on each side of the bottom of the



D. Virginiana—The Virginian Opossum.

abdomen, forming a mere rudiment of a pouch. Of those which have pouches, the Virginian opossum, *D. Virginiana*, is the best known. It is a native of the United States of America and Texas, and is about the size of a cat, but of a thicker form, and has a woolly fur like felt. Its walk is very slow, but it is very active in getting from one branch of a tree to another, by means of its prehensile tail. The young when first littered, become firmly attached to the teat and grow in that position, never leaving the pouch till they are about fifty days old, and even then quickly returning to it on the slightest alarm. Of those which have no pouch, the young when first born adhere to the teat like the others, but when they are able to quit it, they mount upon the back of their mother when alarmed, and twisting their little tails round that of the parent they are speedily hurried out of danger. Such is the *Philander dorsigerus* or Merian's opossum.

Didelphis (δις, double; δελφυς, womb). *The Opossum.*—See DIDELPHIDÆ.

Didus. *The Dodo.*—A genus of birds which has become extinct since the seventeenth century, but which appears to have existed up to that time in the Mauritius. Formerly it was usually classed by naturalists in the family *Struthionidæ*, or amongst the ostriches, but of late much attention has been paid to the history of this lost bird, and it is now arranged in the order *Columbæ*, and family *Columbidæ*, or pigeons. It appears to have been a massive, clumsy bird, ungraceful in form, and with a slow waddling motion, to have been clothed with down instead of feathers, and to have had the wings and tail so short and feeble as to be utterly useless to it for flight.

Difflugia.—A genus of minute invertebrate animals belonging to the group *Protozoa*, and class *Rhizopoda*, or animals whose organs of motion consist of completely retractile ramifying prolongations of the body, and not *cilia*, as in the *Infusoria*. They secrete a membranous shell without visible texture, which is flexible and generally globular or ovoid, and from which, by a terminal opening, spring the short, thick expansions which form the organs of motion.

Digitalis.—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, and containing a number of species, which are found growing in various parts of Europe, Asia, and the Canary Islands. They are for the most part herbaceous plants, and they are generally distinguished by having large and handsome terminal flowers. Several species are in consequence cultivated in our gardens, but they are all suspicious plants and endowed with active properties. The best known and the most powerful of them all is our common fox-glove, *D. purpurea*, one of the most stately and most beautiful of our wild herbaceous plants. Its large and numerous flowers of a rosy colour, spotted with white and purple internally, and hanging gracefully, arranged in one-sided racemes, render it an object of admiration to all. The name fox-glove ought perhaps to be *folk's-glove*, or the gloves of the "good people," the fairies, whom our pastoral fables represent to have been in the habit of using these flowers for caps. The French call it "Doigt de la Vierge," "Gantelée," "Gant de Notre Dame," &c. In Scotland they are called "witches' thimbles," and "dead men's bells." The leaves have an acrid, bitter, disagreeable taste, and their effects on the human system require this plant to be employed medicinally with great caution. The first effects of an over-dose are a painful sense of constriction of the throat and stomach; then follows great excitement, vomiting, severe purging, and finally death. Employed in small doses, digitalis acts as a diuretic and a sedative of the circulation, and its continued use causes great slowness of the pulse, rendering it extremely useful in diseases of the heart, and in spitting of

blood, &c. *Its active virtues are due to a crystalline principle called digitaline.*

Digitaria.—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*, the grasses, and obtaining its name from the singular form of its heads of flowers, which look like fingers. *D. sanguinalis* is a rare plant in England, but very common in Germany, where the boys have an idle trick of pricking one another's noses with its spikelets till they bleed. Hence its specific name. In Poland and Lithuania its seeds are collected and boiled whole like rice, with milk, and is esteemed a pleasant article of diet.

Dillenia. See DILLENIACEÆ.

Dilleniaceæ.—A nat. ord. of dicotyledonous plants, containing a number of species, chiefly trees and climbing shrubs, and inhabiting Asia, tropical America, and Australia. They have alternate, exstipulate, coriaceous, or rough leaves, and usually yellow flowers. The genus *Dillenia* is the type of the family, and contains ten or twelve species, all large and handsome trees, and natives of tropical Asia. The flowers are elegantly pedunculated, and the fruit is acidulous and eatable. The young calices of *D. scabrella* and *D. speciosa*, have a pleasant taste, and are used in curries by the inhabitants of Chittagong and Bengal. The timber of most of the species is hard and durable, and the flowers are large and handsome. Those of *Hibbertia volubilis*, which is a showy, climbing shrub, are intolerably offensive to the smell.

Dillwinella.—A genus of thallogenous plants belonging to the nat. ord. *Algæ*, family *Oscillatoreæ*, and named after Mr. Dillwyn. At one time these plants were considered animals, and some naturalists, by way of getting out of the difficulty existing as to their classification, propounded the theory that they were vegetables at one period of their existence, and animals at another.

Dinornis (δεινός, large, terrible; ὄρνις, a bird).—A genus of birds, now extinct, belonging to the order *Struthiones*, and family *Struthionidæ*. A great quantity of bones of a large bird, apparently extinct, and in a semifossil state, were found in New Zealand, and transmitted to this country, about the year 1839. Fragments of the bones of one species were examined carefully, and proved to belong to a new and hitherto undiscovered bird, of gigantic proportions, allied to the ostrich family, and to which the name of *Dinornis* was given. They were solid, like those of mammalia, containing no air cells, and were found to contain a large proportion of gelatine, proving that the animals to which they belonged had not been extinct for any great length of time. This bird, *D. giganteus*, must have been from ten feet to ten and a-half in height, nearly the size of a small giraffe. Since that time numerous specimens of bones have been transmitted from New Zealand, belonging to birds of the same family, and no fewer than nine different species have been described. Several of these species appear to belong to the same group as the living genus *Apteryx*, such as the *Palapteryx*, *Aptornis*, &c. Another species of bird, belonging to the same family, has been discovered in the island of Madagascar. The eggs and some fragments of bones having been sent to Europe, the name of *Æpiornis* was given to it. One of the eggs was equal in size to 135 hen's eggs, and was calculated to hold two gallons of water.

Dinosauria (δεινός, terrible; σαῦρος, a lizard).—An order of fossil reptiles of immense size, found in the wealden and oolitic formations of England. The structure of the bones shows that they were formed for living on land. Three species have been described, each of them the type of a separate genus. The *Megalosaurus Bucklandii* was discovered in the oolitic strata of Stonesfield and the wealden of Tilgate forest. It must have been a carnivorous reptile, the structure of the teeth, vertebræ, and bones of the extremities showing it to have been related to the crocodilian group, and must have been thirty feet in length. The *Hylæosaurus armatus* was discovered in the wealden of Tilgate forest also. The structure of the teeth showed its carnivorous nature; and its body was covered with scales like those of the crocodile. The *Iguanadon Mantellii*, discovered in the wealden of Sussex, and measuring twenty-eight feet in length, must have been, from the structure of the teeth, an herbivorous reptile. In this respect it resembled the iguana. From the size of the thigh bones discovered, the iguanadon must have been higher on its legs than any reptile known.

Dinotherium (δεινός, terrible; θήριον, animal).—A genus of extinct fossil animals of large size, which, from the structure of the teeth, must have been herbivorous. Remains of these animals have been found in the pliocene formations in different parts of Europe. In size and strength they must have surpassed the elephant, the *D. giganteum* being eighteen feet long. The most striking character in the form of the dinotherium is the structure and position of the two tusks in the lower jaw. These are curved downwards, somewhat like those in the upper jaw of the mastodon, and are strong and powerful. It is supposed to have been an aquatic animal, and the use of these curved tusks is said most likely to have been to hook itself on to the banks of the river in which it reposed its huge form.

Diodon (δίς, twice; ὀδών, a tooth).—See DIODONTIDÆ.

Diodontidæ.—A family of fishes belonging to the order *Plectognathi*, characterized by having the teeth of the upper and under jaws incorporated with the bone of the jaws, without any mesial division, so that they look like one or two great teeth, and present the appearance of the beak of a parrot. This kind of dentition, and the structure of the jaws, are well adapted to cut and bruise the food on which these fishes live—

sea-weeds, shells, and crustacea. The skin is armed with spines of greater or smaller size, and several species possess the power of inflating their bodies, by filling their large stomachs with air. When thus blown up into a globular form, the fins cease to play, the fish turns over, and floats belly upward, driving before the wind and waves, without being able to direct its course, until it has resumed its former shape, by expelling the air. At the same time, this inflation of the body causes the strong spines of the skin to radiate on every side, furnishing an excellent kind of defensive armour. None of them are used as food for man, and indeed their flesh is often very deleterious. This family is divided into three sub-families, the true diodonts, *Diodontini*, the tetraodonts, *Tetraodontini*, and the sun-fishes, *Orthagoriscini*. The genus *Diodon* is the type of the first sub-family, and has both jaws undivided, and the skin armed with large spines. There are several species known, natives of the Indian and American seas. The sea porcupine, or atinge, *Diodon hystrix*, is nearly spherical in shape, and measures not less than two feet in length. When taken, it elevates its spines to the highest possible pitch, as if endeavouring to wound in all directions. Nor can it be touched without danger until it is dead. Its flesh is dangerous to eat, owing, it is stated, to the gall possessing poisonous properties. The diodon possesses several means of defence. It can bite pretty severely, and can eject water from its mouth to a considerable distance; and one species emits from the skin of its body, when handled, a most beautiful carmine-red secretion, which stains substances deeply and permanently. The skin of some of the species is said to be used as a kind of helmet by the natives of the north-west coast of America. The genus *Tetraodon* is the type of the second sub-family. It has the jaws divided in the centre by a perpendicular suture, giving the appearance of four teeth, and the skin is covered with small, slightly prominent spines, which it can raise when it inflates the body with air. One of the species, *Tetraodon lineatus*, found in the Nile, possesses electric powers; and when, as is often the case, it is thrown on shore by the inundations, is collected by the children as a plaything. This species is destitute of spines; and Sir J. Richardson remarks, that it is a law in ichthyology that no electric fish possesses scales or spines. The tetraodons are remarkably tenacious of life, and have a disagreeable odour, which they retain for several years when preserved in spirits. Some of the species of this genus, too, are poisonous. A few years ago two sailors were poisoned at the Cape of Good Hope by eating the liver of a tetraodon, and died from the effects thereof in less than half an hour after eating it. The genus *Triodon* has the skin of the *Tetraodon;* but the upper jaw only is divided, so that they appear to have three teeth. The sun-fishes, *Orthagoriscini*, form the third sub-family; and some of the species are occasional visitants of our own coasts. The genus *Orthagoriscus* is the type; and the species are known by their having the body compressed, spineless, and incapable of inflation; and the tail is so short that they appear to be only the anterior half of a large fish cut in two through the middle. The jaws are like those of the genus *Diodon;* they have no air bladder, and their surface is covered with mucus. They grow to a large size, and their brilliant phosphorescence at night has given rise to their name, sun, or moon fish. The short sun-fish, *Orthagoriscus Mola*, turns round like a wheel when swimming, and has the power of floating with its head and eyes above water. It is four feet in diameter, sometimes much larger, and occasionally weighs from three to five hundred pounds. It is very fat, and yields a great quantity of oil; but the flesh is bad tasted, and exhales a disagreeable odour.

Diodontus.—A genus of hymenopterous insects. See CRABRONIDÆ.

Diomedea. *The Albatross.*—A genus of birds belonging to the order *Anseres*, family *Procellariidæ*, and characterized by having a very strong, large, hard beak, bending in the middle, the upper mandible hooked at the point, short webbed feet, and very strong, long, and narrow wings. The birds composing this genus are the largest of all the water birds; they inhabit all the north and south seas, and live upon the spawn of fish and mollusca. The common or wandering albatross, *D. exulans*, is larger than a swan, being three or four feet in length, its extent of wings varying from ten or eleven to seventeen feet, and its weight often exceeding twenty pounds. It has a wide range without the tropics, being very abundant in the Southern Ocean, off the Cape of Good Hope, &c., and also in the Northern Sea, about Behring's Straits and Kamtschatka. They are very voracious, not only eating fish spawn and shell-fish, &c., but devouring considerable sized fish, and even attacking human beings when floating in the water. Their eggs are considered excellent eating, and the Kamtschatkadales use their entrails, blown up, as buoys for their nets, and their wing bones as tobacco pipes. About ten species have been described, some of which have been raised to the rank of sub-genera.

Dion.—A genus of gymnospermous dicotyledonous plants, belonging to the nat. ord. *Cycadaceæ*. The stem of the Mexican species, *D. edule*, contains abundance of starch, which is extracted and used as arrow root.

Dionea (*Διωνη*, a name of Venus).—A genus of dicotyledonous plants belonging to the nat. ord. *Droseraceæ*. It contains only one species, *D. muscipula*, Venus's fly-trap, or the Carolina catchfly plant, which grows in marshy places in many parts of North America, and is one of the most interesting plants we know. The flower stem is strait, rising to the height of six or eight inches, and terminates in a corymb of elegant

white flowers. The leaves are radical, and spread upon the ground at a little elevation above it; they are fringed round their edges with somewhat rigid cilia, and are so irritable, that when touched by an insect lighting upon them, they suddenly fold up, and catch it as in a trap. As the imprisoned creature strives to escape, it keeps up the irritation in the leaf, which in consequence continues more closely still to grasp its prey, till it is suffocated in its embrace.

Diopsis (*διόψις*, seeing across).—A genus of insects belonging to the order *Diptera*, and family *Muscidæ*. These flies are remarkable for the enormously developed pedicels on which the eyes are situated. They are natives of hot climates, chiefly inhabiting Western Africa and India. One species is found in North America. The telescope fly, *D. Sykesii*, is a native of India, occurring in countless numbers in the western ghauts of the Deccan, at an elevation of 3,900 feet above the level of the sea.

Diorite.—A rock composed of green hornblende and albite, or soda felspar. It is called also *Diabase*, and is a hard kind of *Greenstone*. It is susceptible of taking a fine polish, and might be usefully employed in decorating buildings. Some of the forts of Sebastopol are built of this species of stone. The green rocks of the Pyrenees, called *Ophites*, belong also to this kind of rock.

Dioscoreaceæ. *The Yam family.*—A nat. order of monocotyledonous plants, containing several species, the tubers of which abound in farinaceous matter, and are used as articles of food. The species are twining shrubs, are chiefly natives of hot climates, and for the most part possess a dangerous acrid principle, which renders them generally suspicious. The genus *Dioscorea* is the type, and consists of perennial fleshy rooted or tuberous plants, with twining stems, broad alternate leaves, and loose clusters of small green flowers. *Dioscorea alata*, the West India yam, is one of the best known species, and is a native of the West Indies. It is cultivated also in the East Indies, and the tubers are oblong, brown externally, white internally, and often very large, weighing sometimes as much as 30 lbs. They are used as a substitute for potatoes in tropical climates, and during the time of the potato failure were attempted to be introduced into this country. *D. globosa* is a native of India, and is cultivated in Bengal under the name of choo-puree-aloo. It is considered the best of the Indian yams: the flowers are highly fragrant, and the tubers are white internally. Several other species have the tubers purple coloured, and are also used as food—such are *D. rubella*, *purpurea*, and *atro-purpurea* in India, and *D. bulbifera* in Tahiti. Some of the species on the other hand, which have ternate leaves, possess tubers which are poisonous and have a nauseous taste. This property exists also in the black bryony, another species of the family—see TAMUS—while the mild farinaceous qualities are found in the tubers of TESTUDINARIA.

Dioscoreæ. *The Yams.*—See DIOSCOREACEÆ.

Diosmeæ (*διός*, divine; *σμή*, smell).—A family of dicotyledonous plants belonging to the nat. ord. *Rutaceæ*, containing a good many species which are found chiefly at the Cape of Good Hope and in Australia. They have alternate simple leaves and white or reddish solitary flowers, which are all strongly marked with dots of transparent oil, and diffuse a powerful odour when bruised, but possess a bitter acrid taste. The genus *Barosma*, separated now from the original genus *Diosma*, which gives its name to the family, is peculiar to the Cape of Good Hope; and several of the species known by the name of *Bucku* or *Buchu*, are highly esteemed by the natives and colonists. The Hottentots anoint their bodies with the oil obtained from the leaves by distillation, and in this country the leaves of two or three species, *Barosma crenata*, *serratifolia*, and *crenulata*, have been used in medicine as stimulants and antispasmodics, and are prescribed in the form of tincture and infusion in cases of irritation and catarrh of the bladder. At the Cape an infusion in weak spirits is highly recommended as an external application in cases of bruises or sprains, &c.

Diospyros (*διός*, divine; *πυρός*, flour, or food).—A genus of dicotyledonous plants belonging to the nat. ord. *Ebenaceæ*, and consisting of large trees with alternate, thick, often coriaceous leaves, and growing chiefly in the tropical parts of Asia and America. The ebony tree, *D. ebenus*, furnishes to commerce the black hard wood, well known as ebony. It is a large tree, a native of Ceylon, the Mauritius, and Madagascar. It is the centre of the tree that is most valuable, and as it admits of a fine polish and is very durable, it has always been in much request for mosaic and other inlaid work. Ebony was known to the ancients, and is mentioned in Ezekiel. In 1826, 2,002,783 lbs. of ebony were exported from the Mauritius, giving the estimated value of £9,017 7s. 6½d.; but in 1837 the exports fell to 2,160 cwt.; estimated value only £1,275. There are several kinds of ebony in the market, and there are several species of the genus which furnish wood sold under that name. Several species of *Diospyros* furnish a wood which is known by the name of iron wood, and others yield an edible fruit, such as *D. Kaki*, a native of China and Japan, which is frequently sent to Europe in a dried state, and is known as the date plum of China, or the key fig of Japan. The fruit of the persimmon tree, *D. Virginiana*, a native of the United States of America, when fully ripe, is sweet and palatable. The fleshy part separated from the seeds is made into cakes which are dried and preserved. A kind of cider has been made from it, and a spirituous liquor has been distilled from its fermented infusion. From the fruit of *D.*

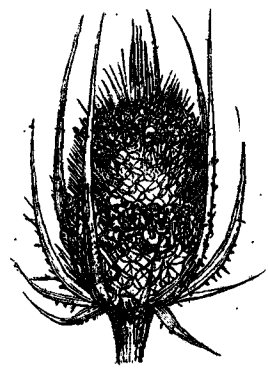
glutinosa, a native of the moist valleys amongst the mountains of the Sircars, and all along the foot of the Himalayas to 30° north latitude, an astringent viscid mucus is obtained, which is used in India for paying the bottoms of boats. When unripe these fruits contain a large proportion of tannin, and an infusion of them is employed to steep fishing nets in to make them more durable.

Diphydæ.—A family of animals belonging to the physograde *Acalephæ*. The little creatures belonging to this family are gelatinous transparent bodies, which appear, when examined closely, to consist of two crystalline-looking pieces like bits of glass. These two portions are always found, the one included within the cavity of the other, but capable of being separated from each other without injury to either. The individual which is the containing body, produces from the bottom of its cavity a long tubular production furnished throughout its extent with proboscidiform suckers, having at their root granular corpuscles and a cirrhiferous filament. In these crystalline pieces we see two or three hollow sub-cartilaginous organs, lined with a muscular membrane, the contractions of which cause the animal to be propelled through the water, and this with considerable velocity. There are numerous species of these pretty delicate-looking little animals found floating on the surface of the ocean, far from land, and assisting in producing the beautiful luminousness of the water, which renders the intertropical seas so brilliant at night. They possess the stinging qualities enjoyed by the other orders of acalephæ. Their mode of reproduction is by gemmation.

Diphyllidia (δὶς, two; φύλλον, a leaf).—A genus of molluscous animals belonging to the class *Gasteropoda*, order *Gymnobranchiata*, and family *Phyllidiidæ*. The species belonging to this genus have no shells, the mantle is soft, with the edges turned up, and they creep slowly on their foot. In all probability they live burrowed in the mud or sand at a little depth in the water.

Diplozoon (διπλόος, double; ζῶον, animal).—A genus of intestinal worms or *Entozoa*, belonging to the order *Trematoda*, family *Onchobothriidæ*, and found living parasitic on the gills of the common bream (*Cyprinus Brama*), the loach and the minnow. The chief character of this genus is, that the individuals are double, the two bodies which are elongated, soft and flattened, being united in pairs by their fusion (see CONJUGATION) near their middle, resembling in form the letter X; each of the individual bodies having the same organization and being provided posteriorly with an expansion furnished with four suctorial discs.

Dipsaceæ. *The Teazel family.*—A nat. ord. of dicotyledonous plants containing a number of species which are herbaceous plants, inhabitants of Europe, the Levant, and the Cape of Good Hope. The flowers are capitulate, surrounded with a common involucre which often makes them resemble a compound flower. The type of the family is the genus *Dipsacus*, which contains about fifteen species, one of which is about the most useful of the whole order. This species, the fuller's teazel *D. fullonum*, has the bracts of the heads very spiny, and they have been much used for carding cloth. It is in consequence cultivated



Capitulum of *D. sylvestris*.

in many parts for this purpose. The roots were at one time considered diuretic and diaphoretic, and bees are said to be very fond of the honey found in the flowers.

Dipsacus (δίψα, thirst). *The Teazel.*—The bases of the leaves of this genus are in many species connate, so that they enclose a cavity which contains water—ready to allay thirst—hence the name. See DIPSACACEÆ.

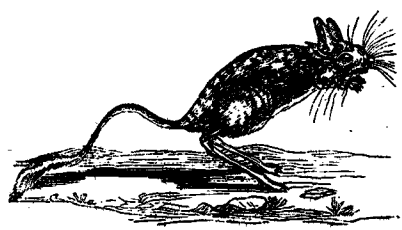
Diptera (δίπτερος, having two wings).—An order of insects characterized by their possessing only two wings, the other pair being replaced by a pair of organs called balancers—see HALTERES. The wings of these flies are membranous like those of the hymenoptera and neuroptera, but different from them in the disposition of the nervures. This order contains an immense number of genera and species which differ from each other in many respects. They are generally oviparous, but some exceptions occur with regard to this. The young of the family *Sarcophagidæ* issue from the mother in the form of larvæ, and those of the tribe *Pupiparæ* remain within the body of the parent till they assume the state of pupæ. Their organization differs so much, that we find the diptera inhabiting the air, the earth, and the water. They are found in all situations and in all climates, some inhabiting the low countries and others the mountains. Some frequent woods, others meadows, fields, and the banks of rivers. Some are always found inhabiting our houses, others are only seen in the foam of the sea, and others again on the snow of the arctic regions. Their food is varied according to the structure of their proboscis, some sucking the blood of animals,

and others (and by far the greater number) sucking the juices secreted by flowers. Some of these insects deposit their eggs in the ground, others upon animal substances when decomposition has commenced, and others again deposit them in the water. Some place them by means of their ovipositors in the substance of plants, producing galls, and others insert them into the bodies of the larvæ of butterflies, &c. The larvæ of dipterous insects show great variety of instinct. Some live in the substance of mushrooms, and line the interior of the galleries they make with silk. Some live in society in the water, and construct peculiar habitations, which form remarkable agglomerations. Others again form pits like the *ant lion*, in which they reside in order to catch their prey. The number of species of this order exceeds that of any other, with the exception of the *Coleoptera;* and far exceeds this in the number of individuals; witness the clouds of *Tipulæ* which rise from the meadows, the numbers of flies which hover over flowers and dead animal matter, and the myriads of gnats and mosquitoes which render certain parts of the world almost uninhabitable. Though in many instances great pests, the diptera serve two important purposes in the economy of nature. They form in great part the food of whole families of birds, and they destroy immense quantities of putrid and decomposing animal matter. Linnæus asserts that three flies will consume the carcase of a horse as quickly as a lion would devour it! It has been calculated that 10,000 species, belonging to this order, are known in our collections; but that, as it is the most neglected order of all the insects, there may probably exist throughout the world nearly ten times as many more!

Dipteraceæ.—A synonyme of DIPTEROCARPACEÆ.

Dipterocarpaceæ (*δις*, two; *πτερος*, having two wings; *καρπος*, fruit.—A nat. ord. of dicotyledonous plants, containing a number of species which inhabit the forests of India, and furnish them with some of their finest and largest trees. Their leaves are marked with thick nervures, and their flowers are panicled and owe their colour to the large calyx, which is often of a reddish hue. Various parts of these trees exude a resinous juice, that from some species being much esteemed as a varnish, while that of others is used as incense, &c. The genus *Dipterocarpus* contains about twenty species, all natives of tropical Asia, large trees with entire coriaceous leaves, and large elegant flowers, white tinted with red, disposed in racemes, and deliciously fragrant. The fruit is a ligneous nut, surrounded by the calyx, which is prolonged in the form of long wing-like lobes. The resinous juice which exudes from this genus resembles very much the balsam of copaiva. A kind of camphor is obtained from *Dryobalanops aromatica* much esteemed by the Chinese—see CAMPHORA—and a species of copal, known in commerce as Indian copal, or gum animi, is obtained by inspissating the varnish got from *Vateria indica*. The fruit of this same tree yields to boiling water the celebrated butter of Canara, or Pinei tallow, DIPTEROCARPUS.

Dipus (*δις*, two; *πους*, a foot). *The Jerboas.*—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Jerboidæ*. The species are characterized by having very short and weak fore legs, very long and strong hind ones, and a long tail, generally tufted at the extremity. Several species of jerboa are known, all living in desert and uncultivated places in the vast solitudes of Northern Africa and Central and Eastern Asia, where they form burrows like rabbits. They are nocturnal animals, sleeping rolled up with their head between their thighs during the day, and sallying forth at night to seek their food. This consists of roots, ears of corn, and other vegetable substances, which they carry to their mouth by means of their front feet. Like the kangaroos, the jerboas generally stand on their hind legs, and are capable of leaping great distances, which they accomplish with such celerity, that they do not appear to use their front legs at all. Indeed the ancients thought they used the hind feet alone, and hence gave them the name of *Dipus*, or two footed animals. The most common species is the common jerboa, *D. Egyptius*, called by the Arabs *Jerbuali*, and a native of Egypt, Syria, &c. The body is about eight inches long, and the tail is ten. The alagtaga, *D. Jaculus* (*Alagtaga vexillaris*), is larger than the common jerboa, and lives in Egypt, Barbary, Palestine, and the sandy tracts between the Volga and the Don. The Mongolians call it *Alagh Decagha*, the Arabs, the lamb of the Israelites, and many authors consider it to be the *Coney* of the Scriptures, and the mouse of Isaiah. The Cape jerboa, *Helamys Capensis*, is the largest species of all the jerboas, measuring from the nose



Dipus Ægyptius—Common Jerboa.

to the tail fourteen inches, while the tail is somewhat more. When eating, it sits upright like a squirrel, is very strong and active, and leaps a distance of twenty or thirty feet at a single bound. It is known by the name of the jumping hare or the spring haas.

Disa.—A genus of orchideous plants. See ORCHIDACEÆ.

Discina.—A genus of mollusca. See BRACHIOPODA.

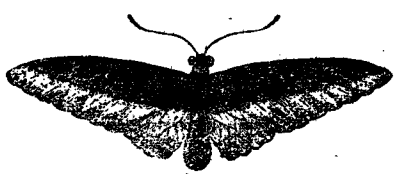
Discophora (δίσκος, a disc or orb; φορέω, to carry).—A division of animals belonging to the Acalephæ.

Diselmis.—A genus of *Infusoria*, according to Dujardin, but believed now to be microscopic *Algæ*. They often give rise to the colour which is observed in sea and fresh water at particular seasons. A species of this genus, described as *Monas Dunallii*, gives rise to the red colour of the reservoirs of the salt works of the Mediterranean.

Distoma (δίς, two; στόμα, mouth).—A genus of *Entozoa* or intestinal worms, belonging to the order *Trematoda*. The species are numerous, inhabiting the alimentary canal or organs of digestion of birds, fishes, and mammalia. Some of the species are very minute, others are four or five lines long, and half a line broad. The body is generally soft, depressed, or cylindrical, and furnished with two distinct and isolated suckers, the anterior of which surrounds the mouth, the other being situated on the ventral surface between the middle and anterior sixth of the body. The best known and most important species is the fluke, *D. hepaticum*, which occurs in the liver of the sheep, and is the cause of the disease, so fatal to them, called the rot. They are found also in the gall bladder and hepatic ducts, and are met with occasionally likewise in the ox, horse, &c. The genus *Distoma* is synonymous with *Fasciola*.

Ditrupa (δίς, two; τρύπα, orifice).—A genus of animals belonging to the class *Annelida*, inhabiting a tubular calcareous shell, so like that of the dentalium, that formerly they were considered part of that genus. The shell is free, tubular and open at both extremities, and the animal is distinctly annelidous, possessing twenty-two branchiæ, arranged in two bundles, each furnished with a single row of cilia. The body is provided with six small bundles of short bristles on each side, and is furnished with a slender concentrically striated operculum attached to a lengthened pedicel. Two or three species are described.

Diurna. *Diurnal.*—A name applied to different tribes of plants and animals. In botany, the term diurnal is applied to those flowers which only blow when the sun is above the horizon. In zoology the same term is applied to those wild



Ornithoptera Brookeana.

animals and birds which seek their food during the day, in opposition to those which feed at night, and are called nocturnal. In entomology it is sometimes used to designate such insects, as the ephemeræ, which do not live more than twenty-four hours; but most generally it is applied to the first of the three large families, into which Latreille divided the lepidoptera, and which corresponds to the genus papilio of Linnæus, or the true butterflies. One of the chief characteristics of this division of insects, is their having the antennæ club-shaped. They only show themselves during the day, and generally only when the sun shines bright, and in a cloudless sky. The rare *Ornithoptera Brookeana*, from Borneo, will give a good idea of the diurnal lepidoptera.

Dolichonyx (δολιχος, long; ονυξ, claw).—A genus of birds belonging to the conirostral tribe of the order *Passeres*, and family *Sturnidæ*. The genus is founded on the little bird *D. oryzivorus*, so common in the United States of America, called the rice bunting, or bob-o-link. This bird is migratory in its habits; spends its winter in the West India islands, and makes its first appearance in the Southern States of America in the month of March or April, making its approach by night. The rice buntings feed on insects and worms, and destroy many larvæ turned up by the plough. They form their nest in grassy meadows on the ground, and lay five or six eggs. At this period the male has a peculiar but very pleasant song, which continues during the time the female is sitting. After the season of incubation is over they extend their migrations, and, in the middle of August, enter New York and Pennsylvania on their way to the south. They then feed on the rice while the grain is soft and milky, and become as fat and plump as the ortolan, and nearly as delicate eating. Great numbers are shot at this season, and the markets are filled with them. In October, when the nights become cold, they continue their course southwards, till they reach Cuba and Jamaica.

Dolichopidæ (δολιχος, long; πους, a foot).—A family of insects belonging to the order *Diptera*, comprising a number of flies, with brilliant metallic colours and long legs. They are very active, some running about with great agility upon trees, walls, &c., in damp situations, others frequenting moist woods, and hovering over the brushwood. Some of the species live upon the juices of plants, others feed upon small insects which they catch upon trees or moist walls. The genus *Dolichopus* contains a good many species, which are brilliantly coloured, and live in moist places, frequently flying over the surface of the water, and resting upon anything which may happen to float upon it.

Dolichos.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and suborder *Papilionaceæ*; and containing several species, with a compressed linear pod and ovate seeds, growing in the East and West Indies. They furnish to the poorer natives of India a pulse which they use extensively for their curries, &c. The boberloo is obtained from *D. Catjang*, and

the horse gram from *D. biflorus*. The *Cowage* or *Cowitch*, the hairs of the pods of which have such irritating properties when applied to the skin, and which, mixed with syrup, are given in cases of intestinal worms, is a plant which was formerly reckoned a species of this genus, but is now transferred to the genus *Mucuna*. *M. pruricus* is the cowage of the West Indies, and *M. prurita* is that of the East.

Dolomedes.—A genus of insects belonging to the class *Arachnida*, and family *Araneidæ*, composed of species belonging to the hunting spiders. At the time of laying their eggs they construct a web in which they deposit their cocoon or nest, and which they sedulously guard till the young are born. When forced to abandon their nest, they carry this cocoon along with them under their sternum. The type of the genus is *D. fimbriatus*, which lives on the banks of marshes and ponds, and runs swiftly on the top of the water, which does not wet the body, even though the insect descends under the surface. It catches flies without spreading a thread, but spins a thick web for its eggs, which it spreads from one branch to another. The web constructed by *D. mirabilis* is in the form of a balloon, the size of a man's fist, and open below. The cocoon containing the eggs is about the size of a gooseberry, and globular; and when the spider leaves its nest it carries it along with it folded up under its chest.

Dolomite.—A variety of magnesian limestone, generally consisting of one atom of carbonate of lime, and one atom of carbonate of magnesia. It is softer than common limestone. It occurs crystallized, as rhomboidal bitter spar, and in large deposits, as a distinct formation overlying the coal formation. The best example of this rock in England is at Belsover, in Derbyshire, from whence the stone was taken to build the new houses of parliament.

Dombeya.—A genus of plants. See BYTTNERIACEÆ.

Donacia.—A genus of insects belonging to the tetramerous *Coleoptera*, and family *Criocerida*. About sixty species of these beetles are known, all living on aquatic plants. They have brilliant varied metallic colours, the under surface of the body being silvery white, and clothed with a fine silky down. The perfect insects have very strongly hooked claws, by means of which they adhere to the plants upon which they live, and the larvæ take up their abode in the roots and stems.

Donax.—A genus of bivalve shells belonging to the family *Tellinidæ*. The shell is usually of a trigonal shape, and the posterior edge is short and truncate, while the anterior is produced and rounded. The species are tolerably numerous, varied in colours, and are found in almost all parts of the world. They are generally small, and live in sands near low water mark, buried an inch or two beneath the surface. In the Mediterranean, and on the coast of France, one or two species are so numerous, that they form a considerable article of food for the poor. About thirty species are found fossil in the later tertiary formations.

Doræna.—A genus of umbelliferous plants. See AMMONIACUM.

Doris. *The Sea Lemons.*—A genus of molluscous animals belonging to the naked *Gasteropoda*, or *Nudibranchiata*. The animals belonging to this genus are destitute of a shell, and have a large simple mantle covering the head and foot, the latter organ being of considerable length. The branchiæ are plume like, and placed in a circle on the middle of the back. The body is protected by a hard convex skin resembling half a lemon, and which is strengthened by spicula more or less definitely arranged. Towards the anterior margin there are two tentacles, which pass through holes in this skin. When perfectly quiet and undisturbed, the animal allows these tentacles and the branchiæ on the back to open out, but the moment it is alarmed or disquieted it withdraws them almost completely. The sea lemons lay a great number of eggs, which form gelatinous bands on stones, shells, sea-weed, &c. In some species the number amounts to 3,000 or 4,000, and in others to even more. The full grown animals are often adorned with beautiful colours, and though generally of a small size, some of the tropical species grow seven or eight inches long. They are most plentiful on rocky coasts, under stones near low water, or amongst the roots of marine plants, and feed upon zoophytes and sponges. They are nocturnal animals, lying concealed during the day, and coming forth at night to seek their food.

Dorsibranchiata.—An order of animals belonging to the ANNELIDA.

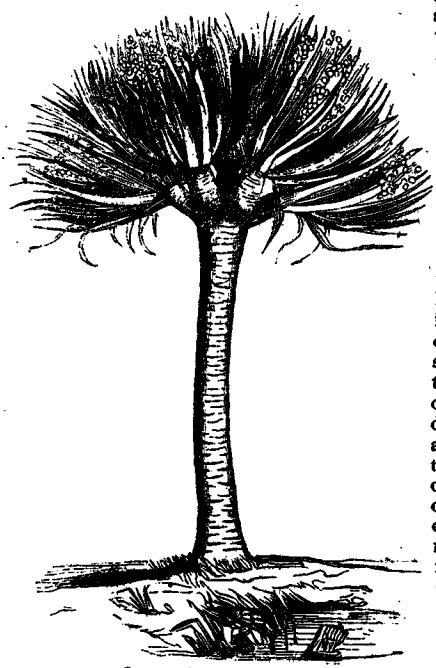
Dorstenia.—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and suborder *Moreæ*, the mulberries. About thirty species are known, consisting of stemless plants with radical leaves, all natives of tropical America. The root of *D. Contrayerva*, and one or two other species, yield the substance known by the name of contrayerva, at one time much used in medicine. It is now little employed in this country, but is said to be still held in esteem in South America as a valuable remedy against the bite of serpents.

Dorthesia.—A genus of insects belonging to the order *Homoptera*, and family *Coccidæ*, and named after the Abbé d'Orthez. The typical species, *D. characias*, is found in the south of France, and lives upon one or two species of *Euphorbiæ*. The body of the female, after her first moult, becomes covered with elongated flakes of a waxy secretion, which if rubbed off grows again. These females are apterous, and when the time approaches for laying eggs there appears at the posterior part of the abdomen a prolongation in the form of a sac, which makes the insect appear twice as long as she was before. The in-

terior of this sac is lined with a fine cottony down, and here she deposits her eggs, which remain there till the young are hatched. They undergo five or six moultings in the course of their life. The males are comparatively much fewer than the females and smaller. They possess wings, are very agile, and their bodies are covered with a short down. A species of *Coccinella* is a great enemy of these insects, devouring vast numbers of their young as soon as they are hatched.

Doryphora.—A genus of beetles. See CHRYSOMELIDÆ.

Dracæna.—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, and sub-order *Asparageæ*; and comprising a number of species of trees, some of which acquire an enormous size. They are evergreens, with simple leaves, which are crowded together towards the ends of the branches, and long, slender, often columnar

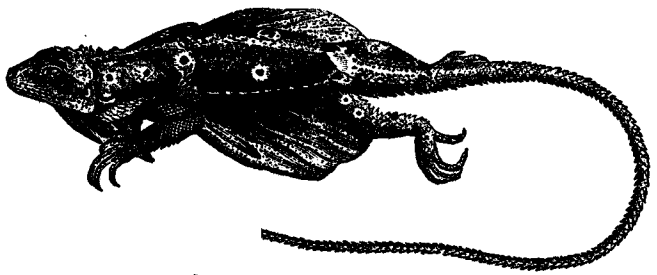


Dracæna draco—Dragon Tree.

stems, resembling palms in habit. About thirty species are known, all natives of warm climates. The most remarkable species of the genus is the dragon tree of the Canaries, *D. draco*, originally, however, a native of India. The stem of monocotyledonous plants is generally simple and without branches, and seldom acquiring any height, but in this species it is the reverse, as the individuals acquire an immense volume. In the neighbourhood of Orotava, in the island of Teneriffe, there is a celebrated dragon tree, which at the time of Humboldt's visit in 1799, was forty-five feet in circumference. In 1402, it was described to be as large and hollow as it is now, and as four centuries and a-half have produced so little change in its growth, it is supposed to be of a very great age. According to Humboldt, this dragon tree and the baobab of Africa (see ADANSONIA), are considered as the oldest living inhabitants of our planet. The resinous substance called dragon's blood is obtained from this species of tree. Few of the others described are of much importance. One of them, however, *D. terminalis*, is extensively diffused in the Eastern Archipelago and islands of the Pacific Ocean. In these latter islands the natives express a sweetish juice from its roots, which by evaporation is reduced to a kind of sugar, while the Sandwich Islanders prepare an intoxicating drink from the same parts, which they sometimes call ava. In the Eastern Archipelago the root is employed as a demulcent in cases of diarrhœa, and the whole plant is held in great esteem as a signal of truth and peace.

Draco. *The Flying Lizards.*—A genus of reptiles belonging to the family *Agamidæ*, and distinguished from the other genera of the family by their having the skin of the sides spread out into the form of wings, and supported by the ends of the ribs. These wings, when the animals are at rest, are folded together on the sides of the body, but when they leap from branch to branch they are spread out, and act as a parachute. They live on trees, and walk with agility. The throat is furnished with three pouches, which they spread out as they lie on the trunks of the trees. Several species are known, differing from one another in the length of these throat pouches and the colour of the wings, but all natives of Asia. The animals described and figured by the early naturalists as species of *Draco* or *Dragon*, were either fictitious beings, artificially prepared from the skins of different animals, or pure creatures of a disordered imagination. In the middle ages, however, and in the days of chivalry, dragons were made to play an important part; and in the romances of that period, were sure to be introduced to try the prowess of the valiant knights, whose heroic deeds they were written to commemorate. They were represented as being either monsters with the body of a huge serpent, the feet of a lion, and an immense throat vomiting out flames of fire, or as destitute of feet, crawling like a serpent, and the huge body covered with hard and impenetrable scales, and so powerful as to be able to crush an elephant with the greatest ease. They devoured men, women, and children, and depopulated whole districts. One of the best known species, of which we give an accurate representation, and which may be taken as the type of the genus, the fringed flying lizard, *D.*

fimbriatus, is a very different creature from any of the monsters called *Dragons* by the ancients. It is a very harmless little lizard, of about ten or twelve inches in length, with its wing-like expansions elegantly spotted with patches of black, brown, and white.



D. fimbriatus—The Fringed Flying Lizard.

Drassus.—A genus of spiders. See ARANEIDÆ.

Drilus.—A genus of pentamerous *Coleoptera*, belonging to the family *Lampyridæ*, or glow-worms. These insects are elongated, and rather depressed. The female, like the generality of the family, is wingless, not luminous, as some others are, and does not differ very much in appearance from the larva. She is much larger than the male, and bears so little resemblance to him, that for a length of time the two sexes were described as two species belonging to different genera. The larva feeds upon the common snail, *Helix nemoralis*, entering the shell, and devouring its inhabitant.

Dromia.—A genus of decapodous *Crustacea*, belonging to the order *Anomoura*, and family *Dromiidæ*. The species have an oval, very convex carapace, which, as well as the legs, are very hairy. They are of an indolent habit, and live in spots where the sea is moderately deep, choosing for their habitation places where the rocks are not covered with sand. They are generally found covered with a species of Alcyonium, or the valve of some bivalve shell, which they retain by means of their hinder feet, and appear to use as a defence against their enemies. The females spawn in the month of July, and lay a great many eggs.

Drosera. *The Sun-dew.*—See DROSERACEÆ.

Droseraceæ (δρόσος, dew). *The Sun-dew family.*—A nat. ord. of dicotyledonous plants, comprising a number of species of delicate herbs, often stemless, and with the leaves and other parts furnished with glandular capitate hairs, of an elegant appearance, which exude drops of a viscid fluid in sunshine. Hence the name of sun-dew, *Ros solis*, has been given to these plants; and an Italian liquor, called *Rossoli*, derives its name from a species of *Drosera* being used in its manufacture. The leaves are generally radical, lying in the form of a star near the ground, and possessing such a degree of irritability that when touched, as by a fly alighting upon them, they contract and catch the insect. The genus *Drosera* is the type of the family, and contains about sixty species, which are of humble growth, very delicate and stemless. They are found in considerable numbers in marshy places of the southern hemisphere, a few only being found in the north. They have a more or less acid taste, combined with slight acridity, and some of them are said to be poisonous to cattle. Others have dyeing properties. *D. rotundifolia*, the common sun-dew, is a native of this country, and the leaves possess a considerable degree of irritability, but not to such an extent as those of another species of the family, the Venus fly-trap of America. See DIONEA. The elegant grass of Parnassus, *Parnassia palustris*, sometimes called the white butter-cup, which has been generally arranged amongst the species of this genus, does not possess the glandulous hairs of the sun-dews, but the stamens are irritable, and move towards the pistil in succession to discharge their contents.

Dryinus.—A genus of serpents. See LEPTOPHINA.

Drymis. *Winter's Bark.*—See MAGNOLIACEÆ.

Dryobalanops.—A genus of plants. See CAMPHORA and DIPTEROCARPACEÆ.

Dryobates.—A genus of woodpeckers. See PICIDÆ.

Durio. *The Durian.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Sterculiaceæ*, sub-order *Bombaceæ*. The species upon which the genus is founded, *D. Zibethinus*, is a large and lofty tree, growing in the Malayan Archipelago, and bears a large fruit, roundish and muricated, divided internally into five cells, and easily separating when ripe into five parts. Each cell contains from two to four or five seeds, enveloped in soft pulp. This fruit is known by the native name of *Durian*, is about the size of a man's head, with a thick, hard rind, covered with firm and angular projections, and is a favourite food of the natives. It is as remarkable for the delicacy, combined with richness of its flavour, as for the intolerable offensiveness of its odour,

which is compared to that of onions in a state of putrefaction. The seed, with its edible enveloping pulp, is about the size of a hen's egg. The pulp is as white as milk, and as delicate in taste as the finest cream. The seeds, when roasted, are eaten, and have the taste of chestnuts. The wood of the tree is used for many economical purposes, and the rind of the fruit, when burnt, is employed by the Chinese in the preparation of some dyes.

Dynastes.—See DYNASTIDÆ.

Dynastidæ.—A family of insects belonging to the pentamerous *Coleoptera*, and division *Lamellicornes*, and comprising some of the largest and most robust forms belonging to the insect kingdom. The males are pre-eminently distinguished by possessing horns or tubercles, arising from the head or thorax. They are harmless creatures, chiefly inhabiting the tropical regions, excavating burrows in the earth, where they conceal themselves during the day, or residing in the decomposed trunks of trees. At night they come forth, and are found running about the footpaths in woods, or flying about the trees. Amongst these beetles, one of the most remarkable is the Hercules beetle, *Dynastes Hercules*, four, five, or even sometimes six inches long, and a native of South America. From the upper part of the thorax proceeds a horn, or process of great length in proportion to the body, sharp at the tip, curving slightly downwards, and furnished throughout its whole length with a fine, short, velvet-like pile, of a brownish-orange colour. The female has no horn. It is stated that these beetles saw off the branches of trees in Guadaloupe, and that the larvæ reside in rotten wood. The elephant beetle, *Megasoma elephas*, a native also of South America, and about three inches long, has the horn long, arched, and bifid at the tip, and a short, but strong, and somewhat oblique horn on each side. The Atlas beetle, *Chalcosoma Atlas*, a native of the Eastern islands, is another fine species. The central horn is shorter than in the two others, but the two side horns are long and curved inwards. The whole insect is of a highly polished metallic surface.

Dysluite.—A mineral, found at Stirling, New Jersey, and occurring crystallized in regular octohedrons. It is composed of alumina, oxide of zinc, peroxide of iron, protoxide of manganese, and a little silica.

Dysodile (*δυσωδης*, stinking).—A kind of combustible bitumen, which, when burned, gives out an offensive odour like assafœtida; hence it is sometimes called *Stercus diaboli*. It is found in masses, or in small beds, with lignite, is highly laminated, and is of a yellow or grayish colour. It is opaque, but its laminæ, when isolated, are translucent, and when plunged into water they separate, becoming more transparent and flexible. It is found at Meliti, near Syracuse, in Sicily, where it is scattered amongst schistose clay, which is inflammable, owing to its presence. A variety occurring near Giessen consists of—bitumen, 49; carbon, 55·5; sesquioxide of iron, 11; silica, soluble in potash, 17·4; clay, &c., 1.

Dysopes or **Dysopus** (*δυω*, to cover; *ους*, a foot).—A genus of animals belonging to the class *Mammalia*, order *Cheiroptera*, and family *Noctilionidæ*, or bull-dog bats. This genus of bats is synonymous with the *Cheiromeles* of Horsfield, which is characterized by the structure of the hind foot. This member is composed of four fingers and a distinct thumb, which corresponds with that of many of the *Quadrumana*. Being a complete antagonist to the fingers, it enables the animal to take hold of objects as with a perfect hand. The species upon which Dr. Horsfield founded the genus *Cheiromeles* is the *D. cheiropus*, and is one of the largest of all the bull-dog bat family.

Dyticidæ.—A synonym of DYTISCIDÆ.

Dyticus.—A synonym, and said to be the proper method of spelling the genus DYTISCUS.

Dytiscidæ.—A family of insects belonging to the pentamerous *Coleoptera*, and containing a considerable number of species of aquatic beetles. They are found in all quarters of the globe, inhabiting stagnant in preference to running water. They swim with great agility, the hind legs acting together in concert, like those of a frog. They are very voracious in their habits, attacking and devouring not only other aquatic insects, but are also occasionally very destructive to young fish in fish ponds. Their fore legs are employed by them as claws in seizing and conveying their prey to the mouth. The genus *Dytiscus*, or *Dyticus*, is the type of the family, and contains some of the largest species of all the water beetles. They are generally of an oval form, narrower in front than behind, the elytra of the males being usually smooth, while those of the females are often furrowed. Though organized for swimming, these beetles can leave the water in which they reside, and fly to a distance. Like other aquatic animals, they are obliged to ascend repeatedly to the surface to obtain a supply of air for respiration. The stigmata, or spiracles, are most of them placed on the abdomen, and when they come to the surface to breathe, they may be seen resting, head downwards, with the extremity of the body protruded out of the water. The larvæ of *Dytiscus marginalis* (one of the largest European species of the genus), are very voracious animals. They are often called shrimps, and measure, when full grown, two inches and a half in length. The head is large, rather flat, and armed with a pair of formidable, curved, hollow mandibles, with which they seize their prey. They commit great ravages among other water insects; and being bold and courageous, they attack even fishes. When they have attained their full size, they quit the water, and creep into the neighbouring earth, where they form with considerable skill a round cell, in which, in about five days, they change to pupæ.

Dytiscus.—See DYTISCIDÆ.

Ebenaceæ.—A nat. ord. of dicotyledonous plants, the species of which are trees or shrubs, some of which are of large size, and possess alternate, generally leathery and shining leaves. They are for the most part inhabitants of the tropical regions of America and Asia, though a few occur at the Cape of Good Hope and in Australia. The wood of these trees is usually very dense and hard, and the fine black hard timber, called ebony, is obtained from several species of the family. See Diospyros.

Eburia (*ebur*, ivory).—A genus of pentamerous *Coleoptera* belonging to the family *Cerambicidæ*. The species are about fifty in number, and their elytra, which are generally brown or ash coloured, are marked with spots in relief of a yellowish ivory colour; hence their name. They live under the bark or in the substance of decayed trees, or remain fixed upon the leaves, upon which they can run with great rapidity; but when touched, allow themselves suddenly to drop to the ground. Like the rest of the cerambicidæ, they produce, by means of their corselets, the sound peculiar to the insects of the family.

Eburna (*ebur*, ivory). *The Ivory Shell.*—A genus of gasteropodous *Mollusca*, belonging to the family *Buccinidæ*. The shells belonging to this genus, as originally constituted, consist of two kinds; one, solid smooth shells, spotted with dark red, the animal being spotted like the shell, and covered with an epidermis; the other, smooth, more elongated, and covered with shining enamel. For this latter, the generic name, *Eburna*, is retained, while the first set are formed into a separate genus, called *Latrunculus*. The shells belonging to the genus *Latrunculus* are more nearly allied in form with *Buccinum*, while the true *Eburnæ* are closely related to the *Ancillariæ*.

Ecbalium (ἐκβαλλω, to throw outwards).—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*, and separated from the genus *Momordica*, with which it has usually been placed. *Ecbalium* (*Momordica*) *Elaterium* is generally called the squirting cucumber, and the character of the genus is derived from the remarkable elasticity with which the fruit, when ripe and distended, opens when touched, and scatters its contents to a considerable distance. The inspissated juice of the fruit constitutes the purgative medicine called *elaterium*, which is used in cases of dropsy. Its cathartic properties depend upon a principle called elaterine.

Echeneididæ (ἐχειν, to hold; ναυς, a ship). *The Sucking Fish*, or *Remora family.*—A family of fishes, which resemble in general character the *Gadidæ*, and which, as the species have in general no spines in the rays of the fins, have been placed lately in the order *Anacanthini*. There is only one genus known, *Echeneis*, the species of which are distinguished by the top of the head being flattened and occupied by a laminated disc, composed of numerous transverse cartilaginous plates, the edges of which are spiny, and directed obliquely backwards. By means of this apparatus these fishes are able to attach themselves to ships, large fishes, as sharks, &c., and other marine bodies. Wonderful stories used to be told of the powers possessed by the sucking fish of detaining ships at sea. For instance, Pliny asserts, "Though the winds may rage, and the tempests sink the bark, it restrains their fury, it destroys their power, it renders immovable those vessels which no chain could stay, no weighty anchor moor." The most common species, and the one known to the ancients, is the Mediterranean sucking fish, or remora, *E. remora*, a small

E. remora—The Sucking Fish.

fish, about fifteen inches long, and resembling the herring in form. Their fins are weak, and as they cannot swim fast, this deficiency is supplied to them by their sucking disc enabling them to adhere powerfully to ships and large fishes, such as sharks, so that they are carried, without any exertion of their own, to such situations as are most appropriate for finding their food. Good use is made of this adhesive power by the natives on the Mozambique coast. A species considerably larger than the Mediterranean one, and called the pilot sucking fish, *E. Naucrates*, is common on that coast, and is employed by them for the purpose of taking marine turtles. A ring is fastened to the tail, and a rope being attached to it, the sucking fish is carried out by the fishermen in their boat, in a vessel of water, and thrown into the sea where the turtles resort. In endeavouring to make its escape the fish attaches itself to the nearest turtle; and as its adhesive powers are strong, both are hauled in together.

Echeneis.—See Echeneididæ.

Echidna. *The Porcupine Ant-eater.*—A genus of animals belonging to the class *Mammalia*, order *Edentata*, tribe *Monotremata*, and family *Ornithorhynchina*. Only one species is known, *E. hystrix*, which, however, is one of the most extraordinary animals of New Holland. It has marsupial bones like the opossums, a merry-thought and cloaca, like birds and reptiles, and the males are furnished with spurs. It is quite destitute of teeth, the tongue is long and filiform, the muzzle is elongated, in the form of a beak, surrounded by horny lips, and the mouth is very small. The feet are short and strong, five-toed, and armed with very long, stout, curved claws.

The body is thickset, and the skin, besides hair, is covered with a number of spines, like those of the hedgehog and porcupine. The echidna is about twice or three times the size of the common hedgehog, is a native of Australia, and digs burrows in the sandy places where it lives, in

Echidna hystrix.

which it remains during the dry season, coming out of the earth only during the rains. It is a sluggish animal, living in a state of apparent suspended animation for eighty hours at a time, and rolled up in a ball like the hedgehog. Its food seems to consist chiefly of ants.

Echimyna.—A sub-family of animals belonging to the order *Rodentia* or *Glires*, and family *Muridæ*, of which the genus *Echimys* is the representative. The fur of the species of this genus is a mixture of flattened spines and hair, the tail is long, scaly, and hairy, the feet are slender, ears large, and muzzle small. *Echimys chrysurus* is about double the size of the brown rat, but is a much more handsome animal. The species are natives of South America and Southern Africa.

Echimys (ἐχῖνος, a spine; μῦς, a rat).—See ECHIMYNA.

Echinidæ. *Sea Eggs*, or *Sea Urchins*.—A family of radiated animals, belonging to the class *Echinodermata*, and order *Echinoidea*. The species belonging to this family are numerous, and are found in most parts of the world. The body, not contractile, oval, or round, is covered with a hard case, formed of twenty perpendicular bands of square or six-sided pieces, sunk in the substance of the skin, and furnished externally with numerous fragile spines. These are affixed by muscles on hemispherical tubercles which allow them to move in all directions, protecting the animals from their enemies, and enabling them to bury themselves in the sand on the shore, when they are left by the retiring tide. Ten of the bands of which the case or shell is composed, alternating with the others, are pierced with minute double pores, through which are sent out small filaments with dilated ends, which enable the animals to anchor themselves to marine bodies. These pierced bands, from a fancied resemblance to the walks in a garden, are called *Ambulacra*, while those which have the tubercles have been compared to the beds of the garden, and have sometimes been called *Areæ pulvilli*. These animals have two separate openings to their digestive canal. The mouth, which is central and in the lower side, is armed with very complicated jaws, furnished with five rather projecting teeth, fitted for biting their food, which consists of small molluscs and crustacea. These jaws are called the lanterns of Aristotle, from having been compared by that author to a lantern. The tubercles upon which the spines are placed are simple rounded prominences, but the spines vary a good deal in shape. They are generally equal sized, conical, and striated, as in *Echinus*; but some species have them large and club-shaped, while others have them very short and truncated, forming in the mass a smooth surface somewhat resembling a tesselated pavement, as in *Heterocentrus*. The *Echinidæ* are all free and unattached, and they progress by means of their spines and ambulacral filaments. In addition to these organs, however, they have other moveable organs scattered over the surface of the body, called *pedicellariæ*. These are prehensile, and are used by the animal to seize hold of objects, which can be passed along from one to another, and may thus be conveyed even from the dorsal surface to the mouth. Some authors, however, suppose these pedicellariæ to be parasitic bodies. The genus *Echinus* may be taken as the type of the family. The body is in general very regularly circular or sub-polygonal, and composed of twenty radiated rows, alternately unequal, of polygonal plates, bristled with diversiform spines of two kinds, and supported on imperforate mamillated tubercles. The ambulacra are constantly of the number of five, and complete. The species are abundant in all the seas of Europe, and several are natives of the coasts of Great Britain. The common sea urchin or sea egg, *E. sphæra*, is found in abundance on clean sea bottoms all round our shores, and at various depths, extending its range from the littoral zone to that of the corallines. These echini are much sought after as food in some parts of Europe, during the latter part of summer, at which time they are almost filled with eggs. Many species are found fossil, especially in the chalk.

Echinocactus.—A genus of dicotyledonous plants belonging to the nat. ord. *Cactaceæ*, and consisting of plants the stem of which is of an ovate or spheroidal form, with the sides divided into many ribs, upon the projecting angles of which are stationed, at short intervals, little spiny stars, which are the rudiments of leaves, and from whose centre the flowers appear. They have all a depressed or spheroidal form, and are generally conspicuous for the beauty of their large flowers. They are natives of Mexico, West Indies, and Brazil, and are known by the name of hedgehog thistles.

Echinococcus (ἐχῖνος, a spine; κοκκος, a nut).—A genus of *Entozoa*, or intestinal worms, belonging to the order *Cestoidea*, and family *Cysticidæ*. The species belonging to this genus have lately been shown to be merely the larvæ of one or more species of *Tænia*, not attaining

their full development until they reach the alimentary canal. See ACEPHALOCYST.

Echinodermata (ἐχῖνος, a spine; δέρμα, skin).—A class of animals belonging to the subkingdom *Centronicæ*, or radiated animals. They obtain their name from their body being covered with a hard coat, formed of variously shaped calcareous pieces, imbedded in the surface of the skin, and consist of a number of families, known as sea eggs, or sea urchins (see ECHINIDÆ), starfishes (see ASTERIADÆ), encrinites (see CRINOIDEÆ), and sea cucumbers (see HOLOTHURIIDÆ). The principal character of the class is, that the animals possess, fixed to the skin, a more or less considerable number of tentacular-shaped cirrhi, at once serving the purpose of locomotive organs, organs of respiration, and organs of touch. They have a distinct alimentary canal, distinct organs of circulation, and a nervous system, forming a ring, generally surrounding the mouth, and giving off radiate branches. Besides the tentacular-formed organs of motion and touch, some of the families have organs called *pedicellariæ*, which serve as organs of prehension. See ECHINIDÆ. The animals belonging to the class echinodermata are all marine, and live on animal food. Most of them are free; and these move about with their mouths beneath; but some are attached, and these are affixed by their backs, and have the mouth above, to enable their limbs to bring the food within its reach.

Echinorhynchus—(ἐχῖνος, a spine; ῥυγχος, a beak).—A genus of *Entozoa*, or intestinal worms, belonging to the order *Acanthocephala*. The species live in the intestinal canal of various animals—beasts, birds, and fishes—adhering by means of their proboscis, which is furnished with a number of hooks. They consist of worms, which have a soft, elongated, subcylindrical body, ridged transversely, and obtuse at both extremities. *E. gigas* is the largest species, and is found in the intestines of the pig.

Echinus (ἐχῖνος, a spine). *The Sea Egg*, or *Sea Urchin*.—A genus of radiated animals. See ECHINIDÆ.

Echium (ἔχις, a viper).—A genus of dicotyledonous plants belonging to the nat. ord. *Boraginaceæ*, the species of which are rough, shrubby, or herbaceous plants, with blue or white flowers. They are numerous, and inhabit the temperate parts of the globe, most of them, however, being European. The viper's bugloss, *E. vulgare*, is a common plant in this country, and with its fine blue flowers, which at first are red, forms a very ornamental plant to our waste grounds. The roots of *E. rubrum* yield a red dye, which is used in the arts.

Ectopistes.—A genus of birds. See COLUMBIDÆ.

Ectozoa (ἐκτος, without; ζωος, living).—A term applied to designate animals living upon the *external* parts of other animals, and distinguished from those which live in the interior, called ENTOZOA. It is a term which merely designate the habitation of the animals, and does not ex press any affinity amongst the animals include in it. Thus we have not only the ANOPLURA but the term includes the LERNEIDÆ, CIRRIPEDIA, &c.

Ectromelii (ἐκτρωμα, abortion; μέλος, limb).—A family of monsters, which are charac terized by a more or less complete abortion o one or more limbs, but not deviating much fro the normal form of the head and trunk. Ther are three kinds of this monstrosity. One is calle *Phocomeles*, where one or more limbs are ex tremely short, so that the feet or hands appea to be inserted immediately into the trunk, giving the appearance of the fin of a seal; hence th name. A second is called *Hemimeles*, wher the limb is only aborted to half its length; fo instance, the fore arm or fore leg appears to b only a stump, without hand or foot, and ofte terminated by only one or more rudimentar fingers or toes. A third set, called *Ectromele* from which the name of the family is derive show an almost complete absence of the thoraci or abdominal members. The cases in which *bot* the thoracic members are wanting are most com mon in man; those in which only one is absen are more common in the lower animals. Th want of abdominal members is much rarer tha that of thoracic. Unlike most cases of monstro sity, the life of the ectromelii is not shortene in consequence of the malformation, the patient generally living to a considerable age. Huma beings who are born with this kind of monstrosit are often very clever in some particular art First-rate painters, and needlewomen remarkabl for great delicacy of work, have occasionall appeared among them.

Edelforsite.—A mineral substance, of white or grayish colour, found at Edelfors, of compact texture, fusing into a white glass, an of the density of 2·58. It is a tersilicate of lime and is allied to Wollastonite, differing only i the proportion of lime in its composition, th latter being only a bisilicate.

Edentata.—An order of animals belonging t the class *Mammalia*, according to some arrange ments, and containing such animals as the sloths armadillos, ant-eaters, echidna, and ornithorhyn chus. The term edentata (wanting teeth) is no strictly applicable to these animals as a group for though some, as the pangolin (*Manis penta dactyla*), for instance, are entirely destitute o teeth, there are others which have a greater num ber than any other species of the terrestria mammalia—the tatou (*Priodonta gigas*) having no fewer than ninety-eight. The chief character of the order are taken, therefore, not from th want of teeth so much as the structure of them Incisive teeth are wanting, and those which they possess are uniformly *one-fanged* merely, and o a more simple structure than those of any othe quadruped. The toes also are terminated b

long powerful claws, well adapted for digging. With regard to habits, the animals of this group manifest a great inferiority to the rest of the mammalia. They show little intelligence, and their movements are slow and embarrassed. The *Edentata*, in the arrangement adopted in the British Museum, form part of the great order *Ungulata*, and are contained in the families Dasypidæ and Bradypidæ.

Ediugtonite.—A mineral substance, consisting of silica, alumina, and a little lime, found along with Thomsonite in the Kilpatrick hills, Dumbartonshire.

Edolius.—A genus of birds belonging to the order *Passeres*, tribe *Dentirostres*, and family *Ampelidæ*. This genus, along with *Dicrurus*, and one or two others, form a small sub-family, *Dicrurinæ*. In general appearance the birds of this group resemble the crows, their body being elongated, and their plumage of a more or less deep black colour, brilliant with metallic reflections of green or blue, mixed with a clear gray and pure white under the belly. Their beak is arched, as long as the head, their tail is forked, and they vary in size from a blackbird to a lark. Some of them are adorned with a small hoop of feathers at the base of the beak. The drongos, as these birds are called, live in small societies in deep forests, and feed upon insects, particularly bees, which they pursue at night and morning. Two species, *Edolius retifer* and *E. remifer*, inhabit South Africa, collecting together in considerable numbers on an isolated tree or withered stump, on the borders of the woods; they sit there watching the bees as they quit the forest to search for their food, or as they return loaded with their spoils, and at such times they destroy immense numbers. At the Cape of Good Hope they are called bee-eaters; and the Hottentots call them devil-birds, and believe they are connected with their sorcerers. The fingah of Bengal, *E. cærulescens*, wages bitter war with the crows, attacking them when they come into their neighbourhood, and driving them away with loud cries. They are in consequence known by the name of the "king of the crows." *E. musicus* has a very sweet note, like that of our thrush; and *E. cristatus* is said to sing as finely as a nightingale. The *Dicrurinæ* are peculiar to the Old World, and are found in India and the neighbouring large islands, in China, in Madagascar, and South Africa. Their flesh is dry and ill flavoured.

Edriopthalma (ἑδραιος, sessile; ὀφθαλμος, eye). *Sessile-eyed Crustacea.*—A legion or division of malacostracous *Crustacea*, distinguished from the *Podopthalma* by their branchiæ or gills not being organs specially formed for the purpose of respiration, but constituting a part of the organs of motion, their structure being peculiarly adapted to serve that end, and by their eyes not being placed on foot-stalks, but being sessile and immovable; hence their name. The mouth is formed for masticating their food, and possesses a pair of mandibles and two pairs of jaws, which sometimes carry a palpus; while the members called (in the podopthalma) foot-jaws are generally transformed into feet for walking with. They have no thoracic carapace; but the thorax and abdomen are composed of a series of rings or joints, separate from each other and moveable. The head is distinct from the thorax. The edriopthalma are divided into three orders, Amphipoda; Læmodipoda, and Isopoda.

Ekebergite or **Sodalite.**—A transparent mineral, occurring in green, gray, or brown masses, with a vitreous or resinous lustre, and composed of silica, alumina, lime, and a proportion of soda.

Elachista (ἐλαχιστος, very small).—A genus of insects belonging to the nocturnal *Lepidoptera*, and family *Yponomeutidæ*. The species of this genus are the smallest lepidoptera known, the breadth of their wings across varying from two to five lines. They are very brilliantly coloured, shining with metallic lustre, and may be considered amongst the lepidoptera what the humming birds are amongst birds. Their caterpillars are equally small, and live in leaves, lodged under the skin. About fifty species are known, all more beautiful one than another, and the majority of them natives of Europe. One species, *E. coffeella*, is found in the West Indies, and its larva causes great destruction to the coffee plants.

Elæagnaceæ. *The Oleaster family.*—A small nat. ord. of dicotyledonous plants, consisting of trees or shrubs, with alternate or opposite, entire, exstipulate leaves, which are often covered with scurfy scales. They are found in all parts of the northern hemisphere, and have no marked medicinal qualities. The fruit is soft and succulent, and though in general dry and insipid, in some species it is juicy and acidulated, and reckoned very good eating. Several species of the genus *Elæagnus* (which is the type of the family), growing in India and Persia, produce fruits which are eaten, and are said to resemble in taste the jujube. *E. angustifolius*, called the "Olivier de Bohéme," a native of the eastern parts of Europe, is one of the most fragrant of all plants. Its dull yellow flowers, hardly remarked amongst the leaves, fill the atmosphere with a delicious perfume, the source of which is not readily discovered by the passer by. The sea buckthorn, *Hippophaë rhamnoides*, is the only species found growing in Great Britain. It occurs on cliffs near the sea, and being furnished with sharp spines, forms a good hedge. The fruit, which is in the form of small, round, orange coloured berries, possessing a considerable degree of acidity, forms, when sufficiently covered by sugar, a pleasant preserve, and the plant itself yields a yellow dye.

Elæis.—A genus of palm trees, containing one or two species which grow in tropical Africa and America, and choose for their habitats hot situations, in argillaceous and calcareous soils.

They produce substances which are of much use to man. The oil palm, or maba of the natives, *E. Gâineensis*, is a native of the western coast of Africa, and yields the oil so well known as palm oil. This oil is obtained by bruising the fleshy part of the fruit, and subjecting the bruised paste to the action of boiling water in wooden mortars. It forms a considerable article of commerce with Europe, where it is chiefly employed in perfumery, in making soap, and in medicine. When imported to this country, the oil is about the consistence of butter, of a yellowish colour, and when fresh, has the smell of violets or of the root of Florentine iris, and a very slightly sweetish taste. In 1852, the quantity imported was 635,267 cwt., of which 111,654 cwt. were re-exported.

Elæocarpeæ (ἐλαία, an olive; καρπος, a fruit).—A sub-order of dicotyledonous plants belonging to the nat. ord. *Tiliaceæ*. They are distinguished from the different species of lime-tree by having lacerated or fringed petals, and anthers, opening at the apex. From a species of *Elæocarpus* is procured the resin and varnish called COPAL. The fruits of *E. serratus*, which are very much like olives when ripe, are said to be pickled or dried, and used in their curries by the natives of India. The nuts of several species growing in India, cleared of the soft pulp which covers them, are curiously sculptured; and being bony, and taking a fine polish, are frequently set in gold, and strung into necklaces. The nuts of *Ganitrus sphæricus*, a middle sized tree, common in various parts of India, as well as the Malayan archipelago, and those of *Menocera tuberculata*, from the forests of Travancore, are what are principally used for this purpose.

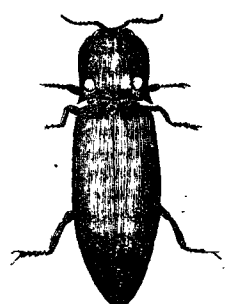
Elæodendron (ἐλαία, an olive; δένδρον, a tree).—A genus of dicotyledonous plants. See CELASTRACEÆ.

Elanus.—A genus of birds. See MILVINÆ.

Elaphrium.—A genus of dicotyledonous plants belonging to the nat. ord. *Amyridaceæ*, and sub-order *Burseræ*, containing a certain number of trees, exuding a balsamic fluid. From *E. Jacquinianum* or *tomentosum*, a native of Curaçoa and Venezuela, is obtained the balsam known as the balsam of Temacahaca, which has a very pleasant smell, exhaling, when burned, an odour between musk and lavender.

Elaps.—A genus of serpents belonging to the order *Ophidia*, and family *Colubridæ*. A considerable number of species are known, living in the southern regions of both Old and New Worlds. The typical species is the coral snake, *E. corallinus*, of a cinnabar red colour, banded with rings of black and greenish-white. Its bite is considered very dangerous.

Elateridæ.—A family of insects belonging to the pentamerous *Coleoptera*, and division *Macrosterni* or *Sternoxi*. The insects belonging to this family were originally all contained in the single genus *Elater*, but in consequence of the great increase of known species, this genus has been split into many, which now form a distinct family. Generally speaking, the elaters are of an elliptical or oval form, sometimes nearly linear, and usually depressed. The elytra are long, narrow, and almost always striated. Their feet are very short, and in consequence they are not able to run fast, but they fly well. They are curiously constructed for leaping when laid on their back, being able to spring to a height of ten or twelve times their own length. This leaping motion is accompanied with a snapping noise, from which circumstance these insects are popularly termed *snaps*. The species are scattered all over the globe, extending even to the polar regions, and live on flowers, and in the trunks of old trees, deriving their nourishment from vegetable matters. In general they are not at all remarkable for brilliancy or variety of colours. Those found in this country are dingy and plain, and of no great size, but some of the species found in tropical climates are large and handsome, and a few are luminous like the glow-worm. The cocuja of South America, *Pyrophorus noctilucus*, is one of the largest and most brilliant of all the fireflies. It is about an inch and a-half long,



Pyrophorus noctilucus—Cocuja fire-fly.

and marked with a smooth, yellow, semi-transparent spot on each side of the thorax. Many stories are told of these insects; the Indians are said to travel in the night with them fixed to their hands and feet, and to spin, weave, paint, dance, &c., by their light. The writer of this was told at Cumăna that the use of them was forbidden to the colonists as the Spanish young ladies used to carry on a correspondence at night with their lovers by means of the light derived from them, two or three confined in a phial giving sufficient light to enable a person to read or write by. He himself has been enabled by the help of only one, to read the title of a book on a shelf in his cabin. The larvæ of the *Elateridæ* live upon wood and roots, and some of them are very destructive to vegetation. The well known wire-worm is the grub of the species, *Agriotes segetis*. This insect is five years in arriving at its perfect state, and during this time it lives on the roots

of wheat, rye, oats, barley, and grass, often committing such extensive damage as to render it necessary to re-sow the ground. The method adopted for destroying these pests, is to scatter pieces of lettuce, sliced potatoes or turnips in the field affected, as a bait to attract them. These being examined in the morning by persons employed for the purpose, the insects are collected and destroyed. Moles and pheasants are also very fond of the wire-worms, and are very useful in destroying them.

Elaterite. *Elastic Bitumen* or *Mineral Caoutchouc.*—A mineral substance belonging to the bituminous inflammable minerals, of a blackish-brown colour, internally shining and glistening, very soft, sectile, elastic, and flexible. It appears to be a compound of carbon, hydrogen, and oxygen, and is found in the lead veins of Castletown, Derbyshire, and in limestone at Montrélais, in the Loire Inferieure.

Elaterium. *The Squirting Cucumber.*—See CUCURBITACEÆ and ECBALIUM.

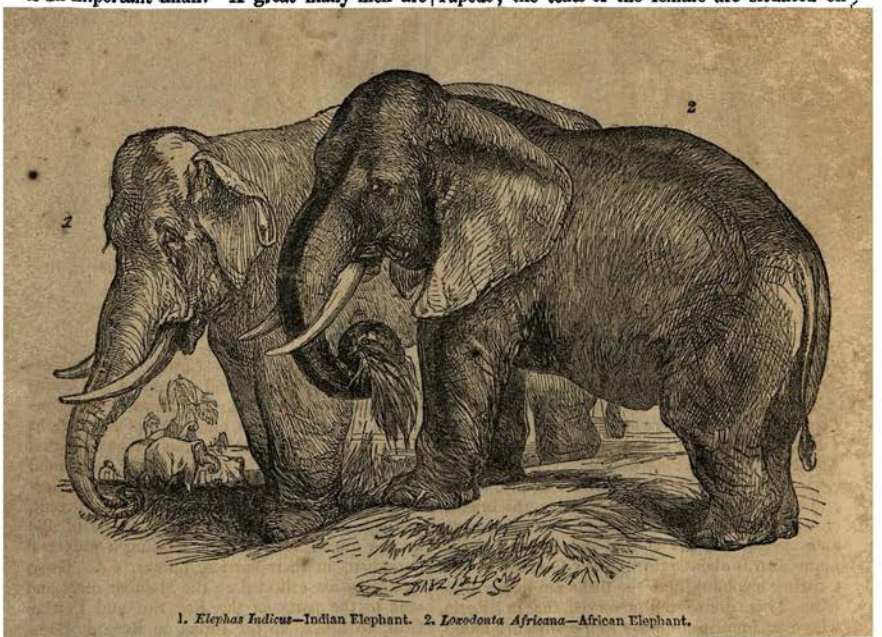
Elatinaceæ. *The Water Pepper family.*—A nat. ord. of dicotyledonous plants, containing a number of species which are annual marsh plants, with hollow creeping stems and opposite *stipulate* leaves. They are found in all parts of the globe, and some possess a considerable degree of acridity; hence the name of water pepper. Two or three species of the genus *Elatine*, which is the type of the family, grow in this country.

Elatine.—See ELATINACEÆ.

Elephantidæ.—A family of animals belonging to the class *Mammalia*, and in the later zoological arrangements corresponding with the order *Pachydermata* of Cuvier and others. The species of this family are heavy unsymmetrical animals, with a thick, hard skin, scantily clothed with rigid hairs. Their cutting teeth and canines are generally distinct and often very large, and their grinders are transversely ridged. Their toes vary in number and are tipped with broad nails or enclosed in a hoof. The nose in some is prolonged into a proboscis, and the nasal bones are enlarged to support the muscles of the trunk. This large family or order contains the elephants (see ELEPHANTINA), the tapirs (see TAPIRINA), the pigs (see SUINA), the rhinoceros (see RHINOCERINA), and the hippopotamus (see HIPPOPOTAMINA).

Elephantina. *The Elephant family.*—A family of the order *Pachydermata* or *Elephantidæ*, containing the largest terrestrial animals in existence. They are distinguished by having a cylindrical, prehensile, very mobile proboscis, furnished at the tip with a small finger-like appendage; two large projecting tusks in the upper jaw, representing the incisors of other animals, and five toes on each foot included in a hard skin. This sub-family contains the elephants, mammoth, and mastodon, &c. The full-grown adult elephants may be said to possess only one molar tooth on each side of each jaw, and they are very peculiar for the manner in which they shed or change these teeth. The first formed teeth as they grow older become thinner and shorter, a fresh set forming behind them. These new teeth press from behind forwards, and as the jaws continue to grow they come partially into use. Soon, however, the old teeth, reduced and decayed by the pressure of these new ones from behind, drop out, and are succeeded by the fresh set. These are pushed out in their turn by another new set forming behind, and this process is repeated till the elephant has changed its teeth eight times. At each dentition the number of plates of which these molar teeth consist are increased. The tusks, which being implanted in the incisive or intermaxillary bones, may be considered as answering to the incisive teeth, are only shed once in the animal's life. This takes place between the first and second year, soon after which the permanent tusks are cut, and gradually increase in size, the ivory being deposited by successive secretions of a vascular pulp in very thin layers from within. These tusks in the adult animal vary much in size, and continue to grow throughout most of the animal's life. They are generally much larger in the male than the female, weighing, in the case of the former, from 50 to 150 lbs. The greatest recorded weight is 350 lbs., but this is extremely rare. Their average length is from six to seven feet, with a diameter at the base from five to six inches. The proboscis or trunk, a most elaborate piece of mechanism, is hollow and always kept moist internally by a secretion of mucus from glands distributed upon its inner surface. It is endowed with exquisite sensibility, the utmost facility of motion, and enormous strength. In its utility and power it is almost equal to the hand of man, and far excels that organ in the monkey tribe. Between 30 and 40,000 muscles are said to enter into its structure, and by their action the elephant is enabled to extend this animated instrument, shorten it, and bend it in every direction, so that there is hardly any curve or position which it cannot assume at the will of the animal, nor any substance, large or small, with which it cannot grapple. This organ "is the elephant's pump, his drinking-cup, his water reservoir, his *jet d'eau*, his powdering apparatus with which he puffs the collected dust over his moistened hide to protect it from flies, his foraging instrument with which he collects his food, and his all-powerful arm." The elephant is a huge unwieldy looking animal, with a naked, thick, callous, and wrinkled skin, generally of a dirty gray or blackish colour. The head is large, and the skull is very thick but light, owing to an extensive thin cellular texture largely developed between, and separating the outer and inner tables. The chamber which contains the brain is comparatively small, and though these animals are proverbially considered very intelligent, the brain itself is small in proportion to that of the

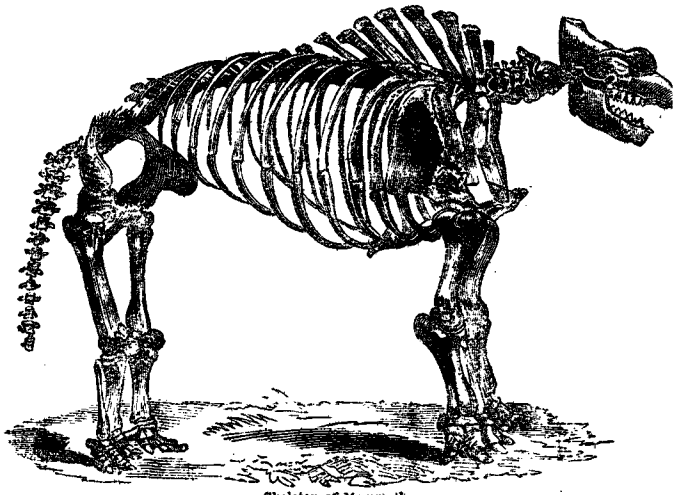
dog or horse, and is only about equal to that of the pig. The eye is very small but extremely quick, and the ears are of great size. The average height of the male elephant is about ten feet from the wither or top of the shoulder. In the wild state elephants live in troops, and inhabit only the most solitary forests of tropical Asia and Southern Africa. The old males march at the head of the troop, the females and the young following in their rear. They live upon vegetable food, and never attack man or other animals, but when attacked by them, defend themselves with great courage and fury. The hunting of elephants in some places, as in Ceylon, is an important affair. A great many men are employed, the animals are taken alive, sometimes 100 or 130 at a time, and sold to the native princes in different parts of India. They are caught without much difficulty and readily tamed. In captivity they show great intelligence and docility, and are easily rendered most useful animals to man, though their reasoning powers have been very much exaggerated. In ancient times they were used in war, but now-a-days they are only employed as beasts of burden, and in processions, or in the chase. They are by no means courageous animals, and at the sound of fire-arms they become panic-struck and fly. They couple in the same manner as other quadrupeds; the teats of the female are situated on



1. *Elephas Indicus*—Indian Elephant. 2. *Loxodonta Africana*—African Elephant.

the chest, and the young suckle the teat with their mouths, and not their trunk, as has often been alleged. The stories told of the extreme delicacy and modesty of these creatures must be received with great caution. Only two species are found recent. One, inhabiting Asia, *Elephas Indicus*, the Indian elephant, found in many parts of India, from the Indus to the Eastern Ocean, and the adjacent large islands, especially Ceylon, has the molar teeth with narrow transverse ridges, and possesses four nails to the hind feet; while the other, inhabiting southern Africa, *Elephas* (*Loxodonta*) *Africanus*, and found extending from Senegal to the Cape of Good Hope, has the molar teeth with lozenge-shaped ridges, only three toes on the hinder feet, and very large ears. The tusks in this species are generally larger than in the preceding, and the females have them of considerable size also. The ivory obtained from the African elephant is more esteemed in the trade than that from the Indian species. The best sort weigh seventy lbs. and upwards, the second best from fifty to sixty lbs. The number of tusks brought to England is very large. The imports for the years 1840 and 1841 averaged 5,556 cwts., of which 4,520 cwts. were retained for home consumption. Taking the average weight of a tusk at sixty lbs., 10,372 tusks were imported in these two years, making it necessary to destroy 5,186 male elephants! In Sheffield alone it is stated that upwards of 45,000 tusks are now annually consumed, and the value is reckoned at £30,000 per annum. The mammoth, *E. primi-*

genius, is only now found in a fossil state, and the pliocene fresh water deposits abound in their remains. Evidence too exists that they have become extinct only at a comparatively recent period. In 1799, a Tungusian hunter discovered a perfect elephant among the ice-blocks at the mouth of the river Lena. It was at that time completely imbedded in the ice, but another visit to the same spot showed it half disengaged, and in 1804, after repeated visits, he found that the enormous mass of ice in which it had so long remained entombed had fallen and laid bare the



Skeleton of Mammoth.

whole carcase. He cut off the tusks and sold them, and the flesh was so fresh that the natives in the neighbourhood fed their dogs with it. The skeleton was afterwards secured, and along with part of its skin is now in the museum of the Academy in St. Petersburg. The skin was covered with two sorts of hair, one woolly, curly, and of a reddish hue, the other hairy, the bristles of which it is composed being long and coarse, and measuring a foot and a-half long. The mammoth is about a third larger than the largest existing elephant, and the tusks are longer likewise. These are so well preserved, that in Siberia, where an immense number of remains are found, they are collected and are held in high estimation. They form the principal material on which the Russian ivory-turners work. Other fossil species of elephants have been discovered, and along with them the remains of an animal belonging to this family and closely related to the genus *Elephas*. See MASTODON.

Elephas.—See ELEPHANTINA.

Elettaria (*elettari*, Indian name for the plant).—A genus of monocotyledonous plants belonging to the nat. ord. *Zingiberaceæ*, consisting of herbaceous plants growing in tropical India, and nearly allied to the genus *Amomum*. The Malabar or true cardamoms are the seeds of one species of this genus, *E. Cardamomum*, which is a native of the mountainous districts of Malabar; and what are called Ceylon cardamoms are the produce of *E. major*. Cardamoms are likewise procured from several species of the genus *Amomum*, but the Malabar cardamoms are considered the best. The plant grows to a height of from nine to twelve feet, has a root like that of ginger, and springs spontaneously in ground where trees have been felled and burned. Cardamoms are gratefully aromatic and pungent, and are regarded as a necessary article of diet by the inhabitants of Asia, forming a universal ingredient in their curries, pillaus, &c. Great quantities are collected on the Malabar coast and sent to the ports on the Red Sea and Persian Gulf, to Sinde, up the Indus, to Bengal, Bombay, &c. The market price, at the places of exportation, varies from 800 to 1,200 rupees the candy (600 lbs. avoirdupois).

Eleutherata.—An order of insects established by Fabricius, and exactly analogous with the order *Coleoptera*, or beetles.

Elophilus or **Hellophilus** (ἕλος, a marsh; φίλος, a lover).—A genus of insects belonging to the order *Diptera*, and family *Syrphidæ*. The flies belonging to this genus resemble very much those of the genus *Eristalis*, and many of them resemble in their colours the humble bees. Their larvæ are known by the name of rat-tailed larvæ, in consequence of their possessing a long tail, which serves as their organ of respiration. They live in stagnant waters, and as it is generally at a considerable depth they keep the extremity of

this tail always at the surface. When they are about to undergo their change they quit the water and bury themselves in the ground.

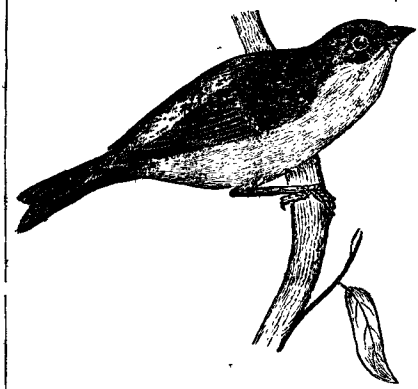
Elymus.—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*.—The grasses composing this genus have a creeping root, and live in the temperate regions of the northern hemisphere. *E. arenarius*, the upright lime grass, is a native of England and grows common on sandy sea shores. It is a coarse grass, but is exceedingly useful in binding down moving sands, and thus helping to recover large tracts of ground from the sea.

Elytra (ἐλυτρον, a sheath).—By this term is designated the horny anterior wings of the insects belonging to the *Coleoptera*, which serve as sheaths or covers for the second pair of wings, and as a protection also for the soft parts of the abdomen. Almost all beetles keep their elytra open when flying, and though they do not appear to assist the insect in this operation, they may act to some extent as parachutes. In the family *Cetoniidæ* alone they are kept closed when the insects are flying. The *Elytra* differ very much in different families and genera in shape and structure, and thus afford good characters for separating them. In some they are soldered together in the centre instead of being open, and generally in these the under wings are altogether wanting. The elytra are chiefly composed of *Chitine*.

Emarginula.—A genus of gasteropodous *Mollusca* belonging to the family *Fissurellidæ*, containing a number of species of shells of a patelliform shape, conical, symmetrical, with the apex inclined backwards, and having a fissure on their anterior edge. They are small, generally whitish and diaphanous, and live on the sea shore at a moderate depth, concealing themselves under stones, in fissures of rocks, or amongst the roots of marine plants. They occur in most parts of the world, and many fossil species are found in the tertiary formations.

Emberiza.—See EMBERIZINÆ.

Emberizinæ. *The Buntings.*—A sub-family of birds belonging to the conirostral tribe of the order *Passeres*, and family *Fringillidæ*. The buntings are distinguished from the other genera of this family by having the bill short, conic, with a straight culmen, and the sides compressed, and the palate armed with a hard tubercle. They live principally upon seeds, for breaking which their bill is well formed; but they eat insects also, which they seek for in woods and gardens. A good many species have been described, several of which are natives of England. The common bunting, *Emberiza miliaria*, is the largest of the European species, and the most common. It remains in England all the year, and from its frequenting corn fields, is often called the corn bunting. The reed bunting, or reed sparrow as it is sometimes called, *Emberiza schæniclus*, is another common British species, frequenting marshy places, and feeding on insects seeds, and small mollusca. It is easily distinguished by its black head and white throat, and its fine note, which like that of the nightingale, is continued during the night. The yellow coloured bird, so well known as the yellow bunting, yellow hammer, yellow yolding, yellow yite, &c., *E. citrinella*, is another species which is a permanent resident in Britain, whilst the equally well known ortulan, *E. hortulana*, is only an occasional visitor. The ortulan is a native of the southern parts of Europe, and closely resembles the yellow hammer. It is very much esteemed for the delicacy of its flesh, and on the continent great quantities are annually caught for the table. It is rather an elegant bird, and has a deep flute-like warbling note, but it is more highly celebrated in the annals of gastronomy, than as a pet or cage bird. Enormous prices used to be paid for ortulans by the epicures of ancient Rome, and they are no less highly thought of by the moderns. In Italy and the south of France they are artificially brought to a high state of perfection for the tables of the wealthy. They are caught in snares, and kept in a room lighted with lanterns, so that they can no longer discern night from day. In this state they are fed with millet seed, oats, and the crumbs of white bread spiced, to which substantial and inviting fare they apply themselves so vigorously, that they soon become delicious lumps of high flavoured fat. When they attain the weight of three ounces, they are considered perfect. Great quantities of these birds are caught in the island of Cyprus, where they are pickled in casks, each containing from three to four hundred, prepared with spice and vinegar. In some years the number of casks exported has amounted to 400, or upon an average, 14,000 of these highly prized morsels. The snow bunting, or snow flake, *Plectrophanes nivalis* or *glacialis*, is also an occasional visitant to this country. It is a native of Spitzbergen, Greenland, Lapland,



Emberiza hortulana—Ortulan.

Hudson's Bay, &c., and is sometimes abundant in winter in the Highlands of Scotland. It sings very sweetly, sitting on the ground. A very pretty species, about the size of a thrush, called the orange-shouldered bunting, *Vidua longicauda*, is a native of the Cape of Good Hope. The female has the simple colours of the sky lark, but the male, during the season of love, assumes a very different garb. His plumage is black, with a large red patch on the shoulder of his wings, and his tail is long, ample, and vertical, like that of the common cock. It is curious, however, that when the love season is over, he lays aside his splendid attire, and assumes the sober garb of his mate. She on the other hand, when she becomes too old to lay eggs, clothes herself, for the rest of her days, in the gay attire the male had only temporarily assumed.

Embryogenia (ἐμβρυον, embryo; γενεα, birth). *Embryogeny.*—The science which treats of the formation of the embryo, and the development of the fœtus at all stages of its intra-uterine existence—a branch of zoology which has lately become an object of special attention to the student.

Emerald (σμαραγδος, green).—A mineral substance composed of silica, alumina, and glucine. It is frequently coloured by a small admixture of oxide of iron. See BERYL.

Emery.—A mineral substance. See CORUNDUM.

Empetraceæ. *The Crowberry family.*—A nat. ord. of dicotyledonous plants, containing a number of species of small shrubs, like heaths, scattered over the colder regions of Europe and America. The genus *Empetrum* is the type of the family, and contains two or three species which are indigenous to Europe, North America, and the Straits of Magalhaens. They are small procumbent shrubs, much branched, of a sombre hue, with shining leaves, small, solitary, axillary, sessile flowers of a deep red colour, and black or red berries. *E. nigrum*, the crake or crow berry, is a native of the mountainous heaths of this country. Crows eat the berries greedily, and they form an article of food for man in some of the northern parts of the world, though they are said to be unwholesome, and to cause headache. A sort of wine has been prepared from them for many centuries, in Iceland and Norway.

Empetrum. See EMPETRACEÆ.

Empidæ.—A family of insects belonging to the order *Diptera*, and forming a natural group. They are carnivorous flies, as well as vegetable feeders, and prey upon other insects which they seize when flying. They may be seen in large swarms like gnats, flying about water in the fine summer evenings, and prey upon phryganeæ, ephemeræ, and tipulariæ. The genus *Empis* is the type, of which thirty-two species have been described.

Empis.—See EMPIDÆ.

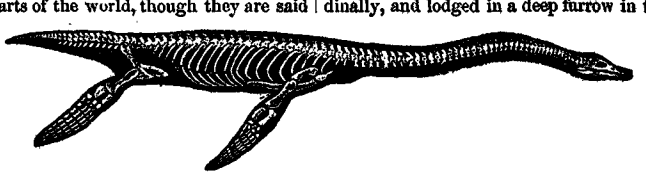
Emydidæ. *The Terrapins.*—A family of fresh water tortoises. See CHELONIA.

Emydosaura = EMYSAURUS (ἐμυς, tortoise; σαυρος, lizard).—A genus of tortoises, synonymous with *Chelydra*. See CHELONIA.

Emydosauri.—An order of reptiles, having the appearance of gigantic lizards, but differing from them in having the body covered with square bony plates. This order contains the crocodile, alligator, and cayman, &c. See CROCODILIDÆ.

Emys.—The type of the family *Emydidæ*. See CHELONIA.

Enaliosauri (ἐναλιος, marine; σαυρος, lizard).—An order of fossil reptiles, the remains of which occur in the oolite and lias, and are chiefly found in Great Britain. These animals had both the fore and hind extremities formed like the fins of the dolphins, and appear to have taken, in the seas of the jurassic period, the place of the cetacea of the present day. Three distinct generic forms have been discovered in this country, appearing to form a link between reptiles and fishes on the one hand, and between reptiles and the cetacea on the other. 1. *Ichthyosaurus*, so named from its appearing to connect fishes and lizards. The characters are: the muzzle of the dolphin, the cranium and sternum of the lizard, the feet of the cetacea, but four in number, and the vertebræ of fishes. The teeth are conical, striated longitudinally, and lodged in a deep furrow in the max-



Plesiosaurus dolichodeirus.

illary bones. The eye and the orbit in which it is set are very large, and the jaws, which were elastic, could be opened to an enormous extent. The neck is very short like that of the fish, and the tail, in length and form, resembles that of the crocodile. Several species existed, and some of them must have been thirty feet in length. 2. *Plesiosaurus.* This creature possesses an extraordinary form. To the head of a lizard it unites the teeth of the crocodile, a neck of enormous length resembling the body of a serpent, and composed of from thirty to forty vertebræ, a trunk and tail of the proportions of an ordinary quadruped, the ribs of a chameleon, and the paddles of a whale. This creature, from the remains with which it is found associated, was

marine, swimming most probably near the surface, arching back its long swan-like neck, and darting it down occasionally at the fish which happened to float within its reach. Sixteen species have been described. The species of both these genera existed in the oolite, extending through the whole period, including the lias and oolite of the wealden chalk formations, and they must have been exceedingly numerous. This is shown not only by the great numbers of their bones found, but by the amazing numbers of petrified remains of their digested food, called COPROLITES. 8. *Pliosaurus.* The animals belonging to this genus are more nearly allied in form to the crocodilian reptiles, than either of the other two. They were gigantic creatures with a short neck, an immense head, and enormous jaws. The teeth are remarkable for their thickness and strength, and they are fixed in sockets. The remains of two species have been found in the Kimmeridge and Oxford clays of England.

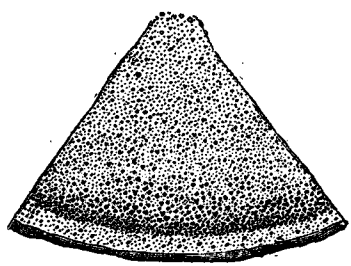
Enchelya (ἐγχέλυς, eel shaped).—A family of animals belonging to the class *Infusoria*, of which the genus *Enchelys* is the type. The species are of very simple organization, and are covered in part, or entirely, with vibratile cilia, which are scattered over the body without any regular order. They are of a cylindrical shape, oblong or ovoid, living in stagnant waters, even in sea water which has been kept for some time, and multiplying by transverse spontaneous divisions.

Enchelys.—See ENCHELYA.

Encrinus or **Encrinites.**—A genus of fossil animals belonging to the *Radiata*, or radiated animals, and containing the beautiful stone lily, or lily encrinite. See CRINOIDEA.

Endocymia (ἔνδον, within; κύμα, embryo).—A peculiar kind of monstrosity which is not uncommon in the human species and other animals. The word is employed to designate those cases in which we find two individuals, unequal in size and in development, one of which is enclosed within the body of the other. In some cases this enclosed individual is only situated under the skin, and contained in an anomalous kind of sac; in others, the individual is enclosed within the abdomen of the other. This parasitic being is always of the same sex as the other. The cases in which this kind of monstrosity occurs, seldom live, the included parasite generally causing the death of the other by its own decomposition. A frequent instance of *Endocymia* is the occurrence of a double egg, one egg being enclosed within the shell of another; sometimes both these eggs want the yolk, at others only one is wanting, and in some instances both eggs are normally organized and of equal size.

Endogenæ (ἔνδον γίνομαι, growing within). *Endogens.*—One of the large primary classes into which the vegetable kingdom is divided, and synonymous with *Monocotyledones.* Instead of the basis of division of plants being taken from the embryo, some authors take it from the mode of growth of the stem. In a large proportion of vegetables the development of the woody fibres takes place from the external part, and in others from the interior. Those in which the development takes place from without, are called *Exogenæ*, and those in which the development goes on from the interior to the exterior, are called *Endogenæ.* The exogens correspond with the *Dicotyledones*, and the endogens with the *Monocotyledones.* The type of this class is the nat. ord. *Palmaceæ*, or palms. The nat. ord. *Gramineæ*, or grasses, belongs also to this class; and the endogenous orders probably contain more plants yielding food for man, and fewer yielding poisons, in proportion to their numbers, than those belonging to any of the other classes.



Section of an Endogenous Stem (*Astrocaryum murumuru*).

Engraulis. *The Anchovy.*—A genus of fishes. See CLUPEIDÆ.

Enhydra (ἐν, in; ὕδωρ, water).—A genus of mammiferous quadrupeds belonging to the family *Fetidæ*, and sub-family *Mustelinæ*, and consisting of only one species, the sea otter. This animal, *E. lutris*, is of considerable size, and appears to connect the otter with the seal. Its hind feet are webbed, and it swims with great celerity. It is exclusively found between the 49th and 60th degrees of N. lat. on the north-western coasts of North America, and the shores of Kamtschatka. The skins of the sea otters, which are perfectly black in full season, are in great request amongst the Chinese, and high prices (from seventy to a hundred roubles each) are paid for them. Since 1814, up to within a few years back, the Russians are calculated to have sent to the market, from California, the enormous number of 80,000 skins.

Entimus.—A genus of insects. See CURCULIONIDÆ.

Entomostraca (ἔντομον, an insect; ὄστρακον, a shell).—A division of the great class *Crustacea.* The fresh water ponds and ditches, and the waters of the sea, abound in numerous little creatures, that when attentively examined are found to belong to the great class *Crustacea.* Differing in many things from the generality of these, such as the lobster, crab, prawn, shrimp, &c., they form a division by themselves to which naturalists have applied the name of *Entomostraca.* Their external envelope or carapace, which is of a horny

or coriaceous texture, is formed of one or two pieces which either completely or in great part cover the body of the animal. In some it approaches in appearance so nearly to that of a bivalve shell, that a person who did not examine with a microscope the animal contained within, would not hesitate at first sight to call it so. The entomostraca are for the most part exceedingly small; they are carnivorous, and are very useful in clearing stagnant waters of putrid animal matter. Their branchiæ or gills are attached either to the feet or organs of mastication. They are preyed upon by larger animals, and form the food of some of our most esteemed fishes. Some of them are parasitic, living fixed upon the bodies of fishes and other aquatic animals. Many undergo a series of changes, amounting to a species of metamorphosis, in their progress from youth to maturity. They are numerous in fresh water, and many are marine; those inhabiting the ocean assisting materially in producing the luminousness of the sea. They have generally been divided into three large groups or legions: BRANCHIOPODA, LOPHYROPODA, and PÆCILOPODA; but two others have lately been added, the sea spiders, or PYCNOGONIDÆ, and the king crabs, or XYPHOSURA.

Entophyta (ἐντος, within; φυτον, plant).—A name used to designate particular plants which are found living within animal bodies. The species of these plants belong to the natural orders *Algæ* and *Fungi*, and they are found, parasitic on the skin and mucous membranes of man and other mammalia, the respiratory organs and eggs of birds, the eggs of reptiles, the skin of batrachians and fishes, and the gills and cellular tissue of the latter, also on the elytra and articulations of insects, in the tissues and intestines of their caterpillars, in the intestines of the myriapoda, and on the vesicles and eggs of mollusca.

Entoselmia.—A genus of foraminifera. See LAGENA.

Entozoa (ἐντος, within; ζωον, animal).—A class of animals belonging to the sub-kingdom *Articulata*, the species of which live parasitic within the bodies of other animals, and are generally known by the name of intestinal worms. Few animals are exempt from these parasites, and in general each genus seems to have one or more peculiar to itself, though frequently several species exist at the same time in the same animal. Thus about twenty species of intestinal worms are found in the cavities or in the muscular substance of man. The entozoa differ greatly from one another in form and organization, and are divided into several orders: —I. NEMATOIDEA, or *round worms*, which have a slender body, more or less filiform and rigid or elastic. The individuals are of both sexes—such are the genera *Ascaris*, *Filaria*, and *Strongylus*, &c. II. ACANTHOTHECA, which have a more or less club-shaped form, with a large head and the mouth in a depression of it and surrounded with four strong, brown, simple hooks—such as the genus *Pentastoma*. The sexes are separate. III. TREMATODA, or *suctorial worms*, the species of which have the body generally flat and soft and furnished with suctorial discs—such as the fluke-worm *Distoma*. In these the two sexes are united in the same individual. IV. ACANTHOCEPHALA, or *hooked worms*, in which the body is slender, round, and sub-elastic, and provided with a retractile proboscis armed with hooks arranged in rows. The individuals are of both sexes. There is only one genus, *Echinorhynchus*. V. CESTOIDEA, the *ribband* or *band worms*, including CYSTICA or the hydatids—animals with an elongated, flattened, soft, continuous or jointed body, and a head either round and provided with a crown of small hooks, or flattened and furnished with two or four suctorial pits called *bothria*. In these the two sexes are united in the same individual. Such are the genera *Tænia* or true tape-worm, and *Bothriocephalus*. In the cystic worms, or hydatids, the body terminates in a sort of vesicle, and the head is surmounted with a crown of small hooks, as in *Tænia*. Indeed, late observations have proved them to be only an imperfect state of the tape-worm—such are the *Cysticercus*, *Cœnurus*, and *Echinococcus*.

Epacridaceæ. *The Epacris family.*—A nat. ord. of dicotyledonous plants, having very much the appearance of the heaths (*Ericaceæ*), with which they were at one time confounded. The species are rather numerous, almost exclusively inhabit Australia, and appear to take the place, in that portion of the world, of the heaths, which are there entirely wanting. They are shrubs with white or red, rarely blue flowers. The genus *Epacris* is the type of the family, containing about thirty species of elegant shrubs with numerous pretty tubular flowers, which grow in New Holland and New Zealand. Many are cultivated for their ornamental appearance, and the fruits of some, such as the native currant of Australia, *Leucopogon Richei*, are edible.

Epacris.—A genus of plants. See EPACRIDACEÆ.

Eperia.—A genus of spiders. See ARANEIDÆ.

Eperva.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ* or *Fabaceæ*. One species of the genus, *E. falcata*, is the wallaba tree of Guiana, with a deep red coloured wood, variegated with whitish streaks. It is hard, heavy, and shining, and impregnated with an oily resin which renders it very durable. The bark is bitter, and is used by the natives as an emetic.

Ephedra (ἐπι, upon; ἑδρα, seat).—A genus of gymnospermous dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Gnetaceæ*. The species contained in the genus are shrubs with many branches, the branches being slender, pendent, with very small scale-like leaves, and peculiar to the maritime shores of the temperate countries of both hemispheres. One species, *E.*

distycha, commonly called the sea grape, and resembling the horse tail or *Equisetum*, grows abundantly along the shores of the Mediterranean. Its berries, becoming red and ripe in July, are slightly acid and agreeable to the taste. They are given, for the sake of their juice, in acute diseases, and the summits of the twigs possess astringent properties. The fruits, indeed, of all the species are eatable, and Gmelin tells us that when travelling in the steppes of Siberia he found them of great use in quenching his thirst.

Ephemera (ἐφήμερα, living for a day).—See EPHEMERIDÆ.

Ephemeridæ.—A family of insects belonging to the order *Neuroptera*, of which the genus *Ephemera* is the type. The species are distinguished by having very short antennæ, delicate wings, and the abdomen terminated by two or three long-jointed bristles, which serve as good characters for the genera and species. The character from which they derive their name is the shortness of their life when they have arrived at their perfect state. The greater number do not live more than one day, and many not more than three or four hours. The larvæ are very similar to the full grown insect, except in wanting wings. They live in the water, forming tubular holes in the mud, and are believed to live two or three years in this state before they begin their metamorphosis. When arrived at their perfect state, they live entirely in the air, and when the female is fecundated she flies over the surface of the water, and drops into it one or two bundles of eggs, containing sometimes 200, which soon sink to the bottom. As soon as this act is accomplished, both male and female insects quickly die. They appear sometimes suddenly in myriads, during fine summer evenings, by the water side, where they may be seen flitting about and balancing themselves in the air in the manner of gad-flies. In Holland their number is sometimes so great that they obscure the sky as with a thick cloud, and when they die they have been seen covering the sides of the canals in a layer an inch in thickness. In Carniola, where similar abundant swarms take place, the peasants collect them, and make use of them as a kind of manure. They form great part of the food of fishes, and they are much used as a bait in fishing.

Epibulus.—A genus of fishes belonging to the order *Pharyngognathi* and family *Cyclo-Labridæ*. There is only one species known, and it is distinguished by having a very protractile mouth, the mechanism of which is very curious. Its large jaws and projecting mandible give it a very peculiar aspect. The scales of this fish are very large; they cover the cheeks, and are there imbedded in the skin, but the face is naked. It lives upon insects which it seizes on the water by suddenly thrusting out its mouth and engulphing those that come within the scope of its elongated tube. The account given by some authors of its shooting drops of water at its insect prey is not based on correct observation.

Epidendrum (ἐπί, upon; δένδρον, a tree) — A genus of monocotyledonous plants belonging to the order *Orchidaceæ*, and containing nearly 300 species that live parasitic upon the bark of trees, and which are almost exclusively found in South America. One species, *E. frigidum*, occurs in Columbia at an elevation of from 12,000 to 13,000 feet, with a mean temperature of 42°, and is covered with a sort of varnish. They vary very much in their general appearance, though usually they are somewhat shrubby, and most frequently have large and lively coloured flowers. A great many of these plants are now cultivated in our hothouses for their beauty and the bizarre appearance of their flowers.

Epidote.—A mineral composed of silica, alumina, lime, protoxide of iron, and a very small proportion of protoxide of manganese. There are several varieties, of which two, called *Zoizite* and *Thallite*, are the chief. *Zoizite*, or lime epidote, is of a grayish, greenish, or brown colour, crystallizing in oblique rhombic prisms, and is found in the primary rocks in Carinthia. *Thallite*, or needle-formed epidote, is a greenish coloured substance, crystallizing in octohedral crystals, and found occurring in fissures of granite, gneiss, and mica slates. The finest specimens come from Dauphiny and the valley of Chamouni.

Epilobium. *The Willow Herbs.*—A genus of dicotyledonous plants belonging to the nat. ord. *Onagraceæ*, and comprising about sixty species, a good many of which are cultivated in our gardens for their ornamental qualities. Several species occur in this country, and are very ornamental to our river sides and moist waste places. The narrow leaved or French willow herb, *E. angustifolium*, is one of these. It is a handsome plant, and grows also in other parts of Europe and in Siberia. In Kamtschatka the pith of the stem is dried and boiled, and on being fermented is converted into ale and vinegar. The hairy willow herb, *E. hirsutum*, another British species, but found like the preceding also in Europe and Siberia, is often called *Codlings and Cream*. It exhales a peculiar acidulous scent which is not unlike hot apple pie.

Epimachus.—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, and family *Upupidæ*, or hoopoes. They have an elongated body, a small head with a strong beak thrice its length, ample concave wings, and legs covered with feathers. The colour of their plumage varies much, black and red predominating. That of *E.* (*Craspedophora*) *magnificus* is of the most gorgeous description. It is of a deep black, with the feathers magnificently glossed with various colours, the long plumes on the flanks being elongated, turned up, and frizzled, the edges of a burnished steel-blue, sometimes inclining to green. The greater number of the species live in New Guinea, and the feathers are

brought to Europe, and used as an ornamental part of dress for ladies. Five species have been described, each of which has of late been constituted as the type of a distinct genus.

Epimedium.—A genus of plants. See BERBERIDACEÆ.

Epiphegus (ἐπι, upon; φηγος, the beech).—A genus of dicotyledonous plants belonging to the nat. ord. *Orobanchaceæ*, and containing only one species, *E. Virginianus*, growing parasitical on the roots of beech trees in the Southern States of the Union in America, where it is called beech drops. A quack medicine exists in America called "Martin's Cancer Powder," which consists of equal parts of this plant and white arsenic. It is said by some writers to have a good effect on cancerous sores.

Epiphytes (ἐπι, upon; φυτον, a plant).—A name used to designate plants growing upon other vegetables. See AIR PLANTS.

Equidæ. *The Horse family.*—A family of animals belonging to the class *Mammalia* and order *Ungulata*. The genus *Equus* is the type of the family, and till lately constituted the only genus belonging to it. Horses have only one toe to each foot, and this is enclosed in a horny hoof or shoe; but on each side of the metacarpus and metatarsus there are two small rudimentary processes which represent two lateral toes. Both fore and hind legs have on the inner side an oval, horny, wrinkled plate, called a wart, sallender, or chestnut; and they have three incisor teeth, six molars, and one canine, in each jaw on each side, the latter of which, however, are wanting in the females. The sense of touch in general is delicate, the tongue is soft, the upper lip capable of elongation and considerable motion; the sense of taste is well developed, and the hearing very acute. The eyes are large and the sight good; the sense of smell is particularly exquisite, and in the wild state the horse is said to be able to smell its enemies at the distance of more than a league. The skin is covered with a short coat of hair, smooth in summer, and becoming rough and elongated in winter. The horse is originally a native of the Old World, those now found wild in America having been carried there from Europe. They live, in the wild state, in large herds, or troops, and are under the guidance of a male distinguished for his power and courage. The horse,

Group of Horses.

Equus Caballus, is one of those animals apparently so connected with man, that it seems to have been created "a domestic animal." The ox, sheep, dog, and horse, are animals which appear to have been placed by the Creator of all things under the direction of man, to be servants to minister to his wants, and assist him in conquering the universe. The native country of the horse seems to be difficult to establish. Many authors assign Arabia as its home, but our first accounts of the horse are from Egypt, and we have no mention of it, amongst historians, as being in Arabia till after the time of Mahomet. In the first campaigns of that conqueror, we have no accounts of cavalry being employed, either in his army or in that of his enemies. The true birth-place of this animal is most probably the high central plateau of Asia, in the north-east chain of the Caucasus. Horses were introduced into Buenos Ayres in 1537, and the colony being then for a time deserted, they ran wild, and extended to the strait of Magalhaens. They are extremely abundant now in that part of the world. On the Pampas, the Guachos, a semi-civilized race of men, live amidst these horses, and their method of capturing and breaking them in is very curious. It is

said they can secure and break in one of these young horses in the course of an hour. The horse is the most useful animal man has. It serves the important purposes of carriage and draught during life, and after death affords its hair, skin, and hoofs as articles of commerce. The number of horses employed in Great Britain for purposes of utility and pleasure, was calculated two or three years ago, to be about from 1,300,000 to 1,400,000. Taking the average worth of these at from £10 to £12 each, the total value of horses in this country (exclusive of young ones) would be from £13,000,000 to £16,800,000! Immense numbers of skins of horses are imported to this country from South America. During the five years between 1838 and 1842, Monte Video and Buenos Ayres yielded annually about 90,000,000 lbs. of oxen and horses' hides, and 9,500,000 lbs. of horse hair. Horse flesh is eaten in many parts of the world, and in several parts of Asia mare's milk forms an article of ordinary diet, and it is also converted into butter and cheese. Horses are exclusively herbivorous and graminivorous animals. The females go with young upwards of eleven months, and they foal standing. There is only one species, but many varieties. As many as seventy-seven are enumerated by Dr. Gray in the British Museum Catalogue. Formerly the ass, zebra, &c., were considered only species of the genus *Equus*, but of late they have been formed into a distinct genus, *Asinus*, which differs in general form and colour, and possesses two characters which are of some importance. In *Equus*, the tail is covered with long hair to the base, totally concealing its actual form; but in *Asinus*, the hair at the base is short, and only long at the extremity. The mane of the horse is long and flowing, whilst that of all the species of *Asinus* is short and upright. The horse has all four legs furnished with the warts, or sallenders, whilst in *Asinus* they are only found on the fore legs. There are several species described by authors. The common or domestic ass, *Asinus vulgaris*, is too well known to need description. It is very doubtful if this species has ever been found in a truly wild state, the wild asses being distinct species. Humble, patient, and tranquil, the ass suffers ill treatment with great constancy. Temperate both as to quantity and quality of food, he is contented with herbs the most hard and disagreeable. Ill fed, ill taken care of, overwhelmed with blows and burdens, the poor creature is indeed a slave. "Its extreme patience, its mildness of disposition, its humble countenance, and its perseverance in labour, pass as the effect of a heavy insensibility; but this is not the only occasion where modesty and useful simplicity have had as recompense, only derision and ingratitude." The ancient Egyptians held the ass in great horror, but the moderns make much use of them, take great care of them, and rear very fine animals. The Indians looked upon them as unclean animals, and held in great contempt those who used them; whilst the Persians and Arabians made much use of them, as did also the Hebrews. The ass is capable of attachment to its master; has good eyes, a quick scent, good hearing, and is very sure footed. Its cry is peculiar, very prolonged and discordant. In the expedition of King Darius against the Scythians, it is recorded that the cry of the Persian asses, belonging to the king's army, frightened the cavalry of the Scythians (among whom that animal was unknown), and made them recoil from the charge. Asses are rare in Sweden and the extreme north of Europe, and though they were introduced to the United States by Washington, they are unknown in the Southern States of the Union. The milk of the ass is considered very light and nutritious, and differs very little, it is said, from woman's milk. It has long been much used for invalids. Of all animals covered with hair, the ass is said to be the least subject to vermin. The skin is hard and elastic, and is used for various purposes: to cover drums, make shoes, and parchment, &c. It is of a gray colour, and is always marked with a longitudinal dorsal streak, of a darker hue, with another across the shoulders, and the ears are long and acute. In the wild asses, the cross streak is not so permanent, and the ears are shorter and rounder. There are two or three species. The onager, koulan, or wild ass of Kutch, *Asinus Onager*, is found wild in the plains of Mesopotamia, Persia, Kutch, the shores of the Indus, and in the Punjab. They are very wild and shy, and live in troops, frequenting the hills in summer, and the plains in winter. The kiang, hemione, or dziggetai, *Asinus Hemionus*, is a native of Thibet. They live in troops of from eight to ten, under the care of a solitary male; are very shy and wild, and run with greater swiftness than the best Arabian horse. This species neighs like a horse, and when taken young, is easily domesticated. Several species of the genus *Asinus* are marked with more or less distinct, transverse, or curved streaks, of a dark colour. These are the zebras, natives of South Africa. The quagga, *Asinus Quagga*, lives in herds on the karoos or plateaux of the Cape Colony. It is of a brown colour, with blackish streaks, and is said to be easily tamed. The zebra, *Asinus Zebra*, lives on the mountains of South Africa, and is of a white colour, with black bands. It is very wild, seeking inaccessible and sequestrated spots for its habitation, and living in herds. These herds graze on the steep hill sides, with a sentinel posted on some adjacent crag, ready to sound the alarm in case of any suspicious approach to their feeding quarters, and no sooner is the alarm given, than away they scamper, with pricked ears, and whisking their tails aloft, to places where few, if any, would venture to pursue. The Dutch colonists call it the *wilde paard*, or wild horse. The peetsi, or peechi, *Asinus Burchellii*, is a fine animal, inhab-

iting the plains beyond the Orange River, and in the ears and tail resembles the horse more than the preceding species does. It is finely marked, possessing much of the graceful symmetry of the horse, and combines comeliness of figure with solidity of form. Its voice is a shrill abrupt

Asinus Burchellii.

neigh, and has no analogy to the braying of the ass. The senses of smell, sight, and hearing are extremely delicate. When these animals are menaced by an attack from either man or beast, they combine in a compact body, and with their heads placed together in a close circular band, they present their heels to the enemy, and deal out kicks in equal force and abundance. Fossil remains of the family *Equidæ* occur abundantly in the newer tertiary formations, and are found mixed with the bones of the rhinoceros, elephants, &c. These occur both in Europe and in Asia; and, what is very remarkable, the remains of at least one species of the genus *Equus*, differing from the European fossils, and the existing species, have been found both in South and North America. The aborigines found in possession of their native countries by their Spanish conquerors, had no tradition or hieroglyphic indication of the existence of such a quadruped; and it may well be called a marvellous event in the history of animals, that a native kind should have disappeared, to be succeeded, in after ages, by the countless herds introduced by the Spanish colonists.

Equisetaceæ } (*equus*, a horse; *seta*, a hair).
Equisetum } *Horsetails.*—A family and genus of acotyledonous plants. See ACROGENÆ.

Equus.—*The Horse.* See EQUIDÆ.

Eranthis (*ἦρ*, spring; *ἄνθη*, a flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*, sub-order *Helleboreæ*, and separated lately from the genus *Helleborus*, from its totally different habit. The typical species is *E.* (*Helleborus*) *hyemalis*, the winter aconite, a small, stemless plant, with a tuberous root, and common in the mountainous parts of central Europe. It flowers early in spring, and may be seen carpeting, with its smooth, green leaves, and its yellow cups of flowers, the ground which a short time before had been covered with ice and snow. It is of an acrid taste, and chewing its leaves will produce inflammation of the mouth. Its root is said to be a strong purgative.

Eresus.—A genus of spiders belonging to the family *Araneidæ*, and comprising a few species, which are characterized by having four eyes placed close together. These spiders live on the trunks of trees and plants, jumping on the trees. They form a sack-like habitation, made of fine white silk, placed between the leaves, which they bring together.

Ergot. *Spurred Rye.*—A fungus, growing on rye. See THALLOGENÆ.

Erica. *The Heath.*—See ERICACEÆ.

Ericaceæ.—A nat. ord. of dicotyledonous plants, of which the heath is the type. The genera belonging to this family are numerous, and have been divided into two or three subfamilies. The *Ericeæ* contain the true heaths, the andromedas and rhododendrons. The genus *Erica* is the type, and of all the genera of plants which the vegetable kingdom possesses, there is none which is more distinguished for species of delicate beauty and elegance of form, though on a small scale. With the exception of scent, which they totally want, the heaths are prodigally supplied by nature with other good qualities. They possess a peculiar persistent foliage, with the leaves so closely arranged as in some species to resemble feathers, and numerous flowers of all sizes, forms, and colours, in which all the hues of red, pink, and purple vie with each other in the most brilliant manner, assuming every tint but blue, and fading into the purest and most transparent white. In some the corolla is two inches long, in others not bigger than a peppercorn, in some it is long and slender, in others inflated like a flask, or dilated like a vase of the purest form, or as round as an air bubble. One species has a corolla rivalling in evenness and polish the finest porcelain; another has it covered all over with hairs, exuding a glutinous secretion, which glitters upon its sides like solid crystals; whilst in a third it assumes the very colour of the leaves, and is only distinguishable by being clearer, brighter, and richer. Heaths, in consequence of this variety and beauty, are universal favourites as ornamental flowers for the garden and hothouse. A few species are found growing in Europe, but by far the greater number are natives of the Cape of Good Hope. The common heath, ling, or heather, *Calluna* (*Erica*) *vulgaris*, covers whole districts in Great Britain, and in the mountainous regions forms a very striking feature in the vegetation. Six species are natives of Great Britain; but between three and four hundred have been enumerated in all; and it has been observed that where they abound few other plants grow with them.

Erichthus.—A genus of *Crustacea*. See STOMAPODA.

Ericulus (a diminutive of *Erinaceus*).—A

genus of animals belonging to the class *Mammalia*, order *Feræ*, family *Talpidæ*, and nearly allied to the genus *Centetes*, or tenrecs. The species are small, and their body is covered with a fur composed of three kinds of hairs—first, ordinary hairs, covering the head as far as the nape of the neck, the limbs, and under part of body; second, several hairs or bristles springing from the lateral parts of the muzzle, and pointing backwards; and third, strong resisting prickles, which replace the hairs on the upper part of the body. The tail is very short, and the feet are armed with rather long claws. Only two species are known, both natives of Madagascar. One, called the *Sora* by the natives, *E. nigrescens*, is about six inches long, and of a blackish colour, sometimes finely speckled with white. It runs and leaps with great agility, and at the appearance of danger raises its spines.

Erinaceus. *The Hedgehog.*—A genus of animals belonging to the class *Mammalia*, order *Feræ*, and family *Talpidæ*. The species are known by their having the body covered with spines, and possessing the power of rolling themselves up into a ball. Several species are known, but the type of the genus is the common hedgehog, *E. Europæus*, a shy and timid little animal, too well known to need much description. When disturbed, it rarely attempts to escape, but rolls itself up into a prickly ball, and from this form will not disengage itself, but rather closes more firmly the more it is irritated, except when thrown into water, on which it speedily unrolls. The hedgehog is a nocturnal animal, and in the winter burrows and becomes torpid. Its food consists principally of insects, worms, slugs, and snails; and from its fondness for insects and its nocturnal habits, is often kept domesticated in London to destroy cockroaches or black beetles A foolish idea was at one time prevalent that it sucked the udders of cows! and in the present day even, a sum of money is annually paid in one district of Warwickshire for destroying these little creatures. The money is paid for "urchins" It has also been denounced as a destroyer of game, and as it is fond of eggs, in this way it may be mischievous in game preserves.

Erinite.—A mineral from Ireland; hence the name. The *Erinite* of Thomson occurs in yellowish-red, compact, fine-grained masses, in an amygdaloidal rock, four miles east of the Giant's Causeway. It consists of silica, alumina, lime, and oxide of iron, with a trace of chloride of soda. The *Erinite* of Turner is a pentarseniate of copper, occurring in apple and verdigris-green masses, accompanying copper ores, especially blue copper ore, at Schwatz, Temeswar, and Matlock. It is composed of arsenic acid, oxide of copper, and a little alumina.

Eriobotrya. *The Loquat.*—A Japan tree. See POMACEÆ.

Eriodendron. *The Wool Trees.*—A genus of dicotyledonous plants belonging to the nat. ord. *Sterculiaceæ*. The species are few in number, most of them natives of America. They are large and lofty trees, with a spongy wood, and the fruit enveloped in a kind of wool. In Brazil the wool of *E. Samamna* is used for stuffing pillows, bolsters, and beds, &c. The flowers of *E. jasminodorum* are white, and smell like those of the jasmine. *E. anfractuosum* is a native of both India and Africa; and in Guinea, the trunk of this tree, which is one of the largest and tallest of the forest trees, is employed by the natives for making their largest sized canoes.

Eriophorum. *The Cotton Grass.*—A genus of plants. See CYPERACEÆ.

Erlanite.—A variety of garnet, occurring near Erla, in the Saxon Erzgebirge, where it forms a bed of 100 fathoms in thickness.

Erodium (ἐρώδιος, a heron). *The Heron-Bills.*—A genus of dicotyledonous plants belonging to the nat. ord. *Geraniaceæ*, and containing upwards of fifty species. They are herbaceous plants, and the great proportion of them are European. Some of them are handsome and ornamental when cultivated. The musky heron's-bill, *E. moschatum*, which emits, when handled, a strong odour of musk, is a most extensively diffused species, being found all over Europe, at the Cape of Good Hope, and in Peru.

Erotylidæ.—A family of insects belonging to the tetramerous *Coleoptera*, of which the genus *Erotylus* is the type, and at one time the only representative. The species vary much in form, but are distinguished by all of them having their antennæ ending in a very distinct and perfoliated mass or club. They are chiefly natives of America, five hundred out of five hundred and seventy species described inhabiting that part of the world. They are found living upon fungi, such as the agarics and boleti, and the larvæ are hatched and developed in the interior of the substance. They possess a disagreeable smell, and when touched, feign death. The species of *Erotylus* are the most remarkable of the family for the brilliancy of their colours and the singularity of their forms.

Eruca.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, or *Brassicaceæ*, containing annual branched herbs, with erect, terminal, racemes of flowers, which are white and yellow, and remarkable for their beautiful reticulation of brown veins. The garden rocket, *E. sativum*, is a native of various parts of Europe and the north of Africa; and in some parts of the continent is eaten, when young and tender, as a salad. When full grown it has an acrid and unpleasant taste, and a strong, peculiar, almost fetid smell. The ripened seeds are a good substitute for the seeds of the mustard, but not so pungent.

Ervilia (diminutive of *ervum*, the bitter vetch). *The Lentil Shells.*—A genus of bivalve mollusca belonging to the family *Tellinidæ*, and containing a small number of minute shells, which are natives of Great Britain, the Mediter-

ranean, West Indies, and the Red Sea. They are flattened, rather solid, cuneiform, or oval shells, the right valve having a single prominent tooth in front, and an obscure tooth behind, and the left having two obscure teeth.

Ervum.—A genus of dicotyledonous plants, belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, and tribe *Viciæ*. It contains several species, the chief of which is the lentil, *E. lens*, a native of continental Europe, and producing the well known bean called lentils. Lentils are not much eaten in this country, but they are consumed in considerable quantities in France, Germany, and Italy. They are the oldest legumes used as food of which we have any record. Ever since the time of Esau they have been eaten in the East. In Egypt and Syria they are parched in a frying-pan and sold in the shops, and are considered by the natives as the best food for those engaged on long journeys. Lentils contain a large proportion of nitrogenized matters, and are in consequence considered very highly nutritious.

Erycina.—A genus of insects. See ERYCINIDÆ. The name has also been applied to a genus of bivalve mollusca, the species of which, however, are now scattered amongst several other genera.

Erycinidæ.—A family of diurnal *Lepidoptera*, the species of which are distinguished by the fore legs of the males being almost rudimentary. They are almost exclusively confined to the warm parts of South America, and are of small size, but for the most part adorned with brilliant colours. Their flight is very rapid, and the majority of them rest with their wings extended on the under side of the leaves. The genus *Erycina* is the type of the family, the species of which are of moderate size, but brilliant in their colours, their wings being often marked with metallic spots.

Eryngium. *The Sea Holly.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Umbelliferæ*, containing nearly one hundred species, most of which are perennial spiny herbs, with the flowers congregated into oblong or roundish dense heads. *E. maritimum*, the sea holly, sea eryngo, or sea hulver, is a native of the sea shores of Great Britain, and the European and African shores of the Mediterranean. The root was at one time used in medicine, having a high reputation in the cure of many diseases, and at the present time is candied and sold in London as a sweetmeat. This preparation is chiefly made at Colchester, in Essex. *E. fœtidum*, a native of the West Indies and Brazil, is considered by the negroes and poorer residents in Jamaica as a valuable remedy in hysterical fits, and is called by them the fit-weed. *E. aquaticum*, a native of North America, is used by the natives as an application to the bite of the rattlesnake, and is in consequence called by them rattlesnake-weed.

Eryon.—A genus of fossil *Crustacea*, belonging to the order *Macroura*, and found in the lithographic limestone at Pappenheim, in the margraviate of Anspach.

Erysimum (ἐρύω, to draw). *The Treacle Mustard.*—A genus of dicotyledonous plants, belonging to the nat. ord. *Cruciferæ*, tribe *Sysimbriæ*, and containing a number of species of annual, biennial, or perennial herbs, with variable leaves, and elongated, terminal, many flowered racemes. *E. cheiranthoides*, worm-seed, or treacle mustard, is a native of Europe and North America. It grows in various places in Great Britain, and has obtained its name of worm-seed from the fact of its seeds being sometimes used as a remedy for intestinal worms. It was also formerly used as an ingredient in the famous Venice treacle, which has given it its other name, treacle mustard. The species described are about fifty in number, most of them natives of Europe; a few growing in the temperate districts of Asia, Africa, and America. *E. Alliaria* (now made the type of a new genus, *Alliaria*), is a native of Europe, and has a strong smell and a taste not unlike garlic, for which it is frequently used as a substitute. It is very generally used by the poor people of the countries in which it grows, as a condiment with bread and butter, salted meats, or in salads. In England it is called sauce alone, or Jack by the hedge. When gathered near its flowering state and boiled, it forms a good pot herb to boiled mutton, or as greens with salted meat. The seeds, when powdered, produce sneezing, and they have been used as a sternutatory.

Erythacus (ἐρυθρός, red). *Red Breast.*—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Luscinidæ*. The robin redbreast, *E. rubecula*, is too well known to need description. Its familiar habits render it a universal favourite with man; and our kindlier sympathies with this little bird are awakened in us in our infancy by the legendary tale of the nursery. So much is this the case, that in every country which Englishmen colonize, the most familiar red-breasted bird which occurs in the land of their adoption is hailed as the robin. The note of the robin is sweet and plaintive, but not very powerful; and he sings throughout all the year. It is one of the latest birds to retire to rest, and the earliest to be seen moving in the morning. The robin is a native of the greatest part of Europe, and is very common throughout Great Britain and Ireland. Notwithstanding his affectionate disposition for his mate and for mankind, he is one of the most pugnacious birds we have. It is solitary in its habits, and is never seen in flocks.

Erythræa (ἐρυθρός, red).—A genus of dicotyledonous plants, belonging to the nat. ord. *Gentianaceæ*, and containing about thirty species of plants, which are simple, or branched and dichotomous, and generally with rosy flowers. They are cosmopolitan plants, occurring all over the

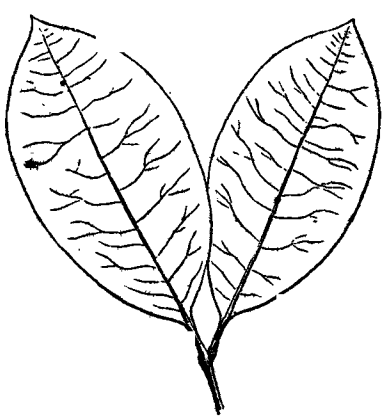
world, and growing alike on mountains, in plains, on the sea shore, or in shady woods. The little centaury, *E. centaurium*, at one time held a high reputation in medicine, and is still used as a stimulating tonic. Its virtues depend upon a principle called centaurine.

Erythræus (ἐρυθρός, red).—A genus of insects belonging to the class *Arachnida*, order *Acaridæ*, and family *Trombidiidæ*, and commonly called *red spiders*. There are four or five species known, the typical one of which is *E. ruricola*, a very small species, of a beautiful carmine red colour, generally found in dry places, under stones, or running on the bark of trees. In general they live isolated, and prey upon other insects, smaller than themselves. Gardeners are prejudiced against red spiders, from an erroneous notion that they poison plants; whereas, in fact, they cleanse them from other offensive insects.

Erythrina (ἐρυθρός, red).—A genus of dicotyledonous plants belonging to the papillonaceous tribe of the nat. ord. *Leguminosæ*, and containing about sixty species of small trees or shrubs, growing in the tropical parts of the world. The flowers of most of them are large, elegant, numerous, of a very bright red, or vermilion colour, and disposed in long bunches. They are often called coral-trees. From *E. monosperma*, a native of India, we obtain gum-lac. The bark and leaves of another species, *E. indica*, also a native of India, are so rich in tannin, that it is said if the dead bodies of animals are covered with them, putrefaction is for a long time resisted. The natives of India have a great veneration for this tree; and we are told that on the day of their marriage a branch is carried into the house of the married couple.

Erythrinus (ἐρυθρός, red).—A genus of malacopterygious fishes belonging to the family *Clupeidæ*, containing several species, which are found in the fresh waters in hot climates.

Erythroxylaceæ (ἐρυθρός, red; ξύλον, wood).—A nat. ord. of dicotyledonous plants, consisting of shrubs or trees with alternate stipulate leaves, and growing chiefly in the West Indies and South America. The genus *Erythroxylon* is the only one belonging to the order, and contains several species, which possess tonic, purgative, and narcotic qualities; while others are remarkable for the red colouring matter which the wood contains, which is used as a dye, and gives the name to the genus. The coca, *E. coca*, possesses stimulant narcotic qualities, more remarkable in their effect upon the human system than tobacco or opium. It is a native of Peru, and is cultivated extensively in the Andes at an elevation of from 2,000 to 5,000 feet above the sea. It is a shrub from four to eight feet high; and the dried leaves are chewed by the Peruvians mixed with finely powdered chalk, to a very great extent. The use of this stimulant brings on a state of apathy and indifference to all surrounding objects, and the desire for it increases so much with indulgence, that it is said a confirmed coca chewer is never reclaimed. It prevents hunger and sleep, and the natives who



Erythroxylon Coca.

work in the mines are by its use enabled to labour twenty or thirty hours at a stretch without sleep. An Indian will exist on very little food with the use of coca, and will travel two and three days with scarcely anything else to sustain life. The continued use of it, however, seldom fails to bring the chewer to as miserable an end as opium does its victims. Notwithstanding this, the natives are so addicted to its use, that the cultivation of coca is an important feature in Peruvian husbandry, the value of this drug in Peru and Bolivia amounting to about two and a-half millions of dollars annually.

Erythroxylon.—See ERYTHROXYLACEÆ.

Escallonieæ.—A tribe of saxifrages. See SAXIFRAGACEÆ.

Eschara.—A genus of corals. See POLYZOA.

Eschinomene.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Mimoseæ*. From a species of this genus, *E. paludosa*, a native of India, is obtained a very light substance much used in that country for making hats which are impervious to the rays of the sun. It is also used instead of cork for lining insect boxes sent home to this country. From another species the rice paper of China is said to be derived, though it is now considered to be obtained from a species of *Aralia*, *A. papyrifera*.

Eschscholtzia.—A genus of dicotyledonous plants belonging to the nat. ord. *Papaveraceæ*, and containing two or three species of beautiful yellow-flowered plants, inhabiting California and the north-western coast of North America, and now become extremely common in the gardens of Great Britain.

Esocidæ.—A family of malacopterygious fishes, having no adipose dorsal fin, and with

the upper jaws edged by the intermaxillaries. Diffuse vascular ramifications exist on the inner surface of the skin, which are peculiar to this family. They are generally voracious creatures, and prey upon smaller fishes. By the abstraction of groups formerly included in the pike family, only the single genus *Esox* remains to represent it.

Esox. *The Pike.*—A genus of fishes belonging to the family *Esocidæ*, and having as its type *E. Lucius*, the common pike, jack, or gedd, a native of Europe, Asia, and North America. The pike is an inhabitant of the fresh water, and is one of the most voracious fishes we have. It is long lived, and many wonderful stories are told of the extreme age individuals have attained. In our own country they have been mentioned as being certainly ninety years old, and as having reached the length of nine feet. When properly cooked, the pike is very good eating. On the Volga, the natives dry and smoke them, first having pickled them for three days in brine. In Germany caviare is made of their roe, and in the Electorate of Brandenburg they mix the roe with sprats and make a dish called netzin, which is esteemed delicious.

Essonite.—A variety of the garnet, called also cinnamon stone, or canelstein. It comes in granular masses from Ceylon. The colour is between hyacinth-red and orange, and it is composed of lime, silica, and alumina. With the blowpipe it fuses into a greenish glass.

Estrelda. *The Wax-Bills.*—A genus of birds. See FRINGILLINÆ.

Etheria.—A genus of fresh water bivalve *Mollusca*, living attached to shells and stones in the Nile and other rivers of Africa. The mantle lobes are free, with a large quadrate foot like that of the *Uniones*, and the shell is pearly and blistered internally, and covered externally with a green epidermis which is often eroded. The inhabitants of the banks of the Nile, above the first cataract, collect them for ornamenting their tombs; and the number of these shells found in such places throughout Ethiopia is said to be very great. Some years ago these shells were rare in collections, three specimens having been sold, by public auction, for £75.

Eublepharis.—A genus of reptiles. See GECKOTIDÆ.

Eucalyptus (*ευ*, well; *καλυπτος*, covered). *The Gum Trees.*—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*. They are peculiar to Australia, and are remarkable for their operculated calyx, which may be considered as formed by several jointed leaves (like those of the orange) united throughout, and separating at the articulation in the form of a lid. The species are all lofty trees, some of them attaining a height of 200 feet, and may be considered as amongst the most important trees in the colony. They are exceedingly numerous, clothing the surface both of Van Diemen's Land and Australia. They are of rapid growth, but often become hollow, and are then used by the traveller as a roomy shelter for the night, or by the natives as a cemetery for their dead. The timber is useful for domestic and carpentry purposes; being so soft at first as to render the felling, splitting, and sawing up of the tree, when green, a very easy process, but when thoroughly dry, becoming as hard as oak. The bark of *E. resinifera*, or white gum tree of Van Diemen's Land, furnishes an astringent gum almost equal to kino, and called Botany Bay kino, and so abundantly, that a single tree will yield sixty gallons. The bark of this species and some others is so hard as to obtain for them the name of iron bark trees by the colonists. *E. mannifera*, the manna tree of Moreton Bay, exudes a saccharine mucous substance resembling manna; and *E. robusta* contains large cavities in its stem between the annual concentric circles of wood, filled with a most beautiful red or rich vermilion coloured gum, which flows out as soon as the saw affords an opening. An essential oil is obtained from *E. piperita*, the blue gum, or peppermint tree, which resembles in everything that of the peppermint, only that it is not quite so pungent.

Eucera.—A genus of insects belonging to the order *Hymenoptera*, and family *Apidæ*, and nearly allied to *Anthophora*. These bees have a very rapid and noisy flight, and the females hollow out cylindrical nests in the ground to the depth of several inches. The cells are composed of earth, and are very smooth on the inside.

Euclase (*ευ*, easily; *κλαω*, to break).—A mineral substance composed of silica, alumina, and glucine, very fragile, of a mountain-green colour, and a vitreous lustre. It is found in Brazil and in Peru.

Eudialyte.—A mineral of a foliated structure and a reddish-violet colour, found in gneiss rocks in Greenland, and composed of silica, zirconia, lime, and soda, with a little oxide of iron and manganese.

Eudromias.—A genus of birds. See CHARADRIIDÆ.

Eudytes.—A synonyme of *Colymbus*. See COLYMBIDÆ.

Eugenia.—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, and containing numerous species of small trees and shrubs, inhabiting the hot and tropical parts of the world, being found in the West Indies, South America, West Africa, and Asia. In habit and inflorescence they resemble many of the myrtles, and several of them secrete a warm volatile oil. The all-spice or pimento, *E. Pimenta*, is one of these, and is a native of South America and the West Indies. From being cultivated in Jamaica, it is frequently called Jamaica pepper. A single tree often produces 150 lbs. of the raw fruit or berry. All-spice obtains its name from the s[illegible] being thought to resemble in its fragrant a mixture of cinnamon, cloves, and nut[illegible]

is much used as a spice in cookery, and large quantities are annually imported from Jamaica. The jambos or rose apple, which has a fruit like a small yellowish apple, and diffuses in the mouth, when eaten, a taste like the odour of rose, used to be considered a species of this genus, and is the *E. Jambos* of older botanists. It is now, however, removed, and forms a separate genus under the name *Jambosa*.

Euglena (*ευ*, beautiful; *γλαινη*, the eye).—A genus of *Infusoria*, consisting of minute animals of a green or reddish colour, and of a very variable form. They live chiefly in stagnant waters, such as ponds and ditches, and abound sometimes to such an extent that they colour the water. When swimming freely, which they do by means of their flagelliform filament, they are of an elongated form; but if mutilated or stopped in their progress, they contract into a ball.

Euglossa.—A genus of insects belonging to the order *Hymenoptera*, and family *Apidæ*. The species of this genus resemble very much the humble bees. They appear to be peculiar to the West Indies and South America, and it is most probable that it is a species of this genus which forms the green honey, so much sought after in the West Indies.

Eukairite. *Argento Selenide of Copper.*—A mineral substance found in a copper mine in Sweden, and occurring in lead-gray and silver-white masses, with a metallic lustre. Before the blowpipe it fuses, giving out the odour of horse radish, and leaving a globule of lead. It is composed of selenium, silver, and copper.

Eulabetinæ. *The Grakles.*—A sub-family of passerine birds. See STURNIDÆ.

Eulima.—A genus of gasteropodous *Mollusca* belonging to the family *Pyramidellidæ*, and containing a number of species, the shells of which are small, white, elongated, with an entire mouth, and a remarkable polished and shining exterior. The operculum is small, horny, and subspiral. Several species inhabit the Mediterranean, others, and those the largest, are found in India and the Pacific Ocean, while a still greater number are found fossil.

Eulimene.—A genus of entomostracous *Crustacea* belonging to the legion *Branchiopoda*, order *Phyllopoda*, and family *Branchipodidæ*. This genus was founded upon a small species found at Nice, but it is only a badly preserved specimen of the genus *Artemia*.

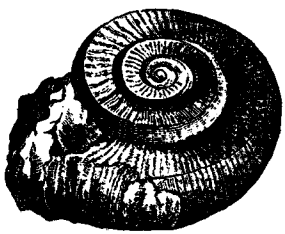
Eulysite.—A granular mixture of augite, garnet, and a mineral related to olivine, forming strata in gneiss in Sweden.

Eumenes.—See EUMENIDÆ.

Eumenidæ.—A family of insects belonging to the order *Hymenoptera*, and consisting of what are termed the solitary wasps. These wasps live [illegible]ted, and consist only of males and females, [illegible] being no neuters nor workers. The genus [illegible] is the type, some of the species of which form their nests of fine earth, of a spherical shape, on the stems of plants, such as heath, &c. After stocking it with a supply of honey, they deposit an egg and close the mouth. When the larva is hatched it lives on the honey, and the perfect insect makes its way out through the sides. Other species such as some of the genus *Odynerus*, form burrows in the sand to the depth of several inches, in which they construct their cells, and stock them with a supply of food consisting of the larvæ of other insects.

Eumolpus.—A genus of beetles. See CHRYSOMELIDÆ.

Euomphalus (*ευ*, wide; *ομφαλος*, umbilicus).—A genus of fossil gasteropodous *Mollusca* belonging to the family *Turbinidæ*. Many species have been described, occurring in the lower silurian formation, and consisting of depressed or



Euomphalus pentangulatus.

discoidal shells of considerable size, with a polygonal aperture, and a very wide umbilicus. They are generally smooth, sometimes striated, rarely tuberculated, and they have a shelly operculum, which is round and multispiral.

Euonymus.—A genus of plants. See CELASTRACEÆ.

Eupatorium.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Corymbiferæ*, and tribe *Eupatoriaceæ*. This genus contains about 294 species, which are herbs or shrubs, and abound in America. Like most of the plants of the sub-order to which they belong, many of the species possess bitterness with an aromatic odour. The hemp agrimony, *E. cannabinum*, is the only European species. It grows in England, chiefly on the banks of streams, is about three feet high, and has a slightly aromatic smell. The roots possess purgative and emetic qualities when taken in large quantities. They were at one time employed in medicine, but are now disused. The whole plant is bitter, and an infusion of it is said to be the common medicine of the turf diggers in Holland against the ulcerations and diseases of the feet and legs to which they are subject. The leaves of the thorough wort or thorough wax, *E. perfoliatum*, a native of North America, have been recommended as a valuable tonic and stimulant, and used as a substitute for Peruvian bark. The ayapana of Brazil, *E. ayapana*, originally a

native of South America, on the right bank of the river Amazon, possesses very powerful sudorific properties, and at one time enjoyed a great reputation in the cure of bites of venomous serpents. It contains gallic acid and a little benzoic acid.

Euphema. *The Grass Parrakeet.*—A genus of birds belonging to the family *Psittacidæ*, and containing several species which are natives of Australia. They are very pretty birds, fly quickly, and feed upon the seeds of grasses. *E. elegans*, the elegant grass parrakeet, inhabits South Australia, where it is known to the colonists by the name of the ground parrakeet. It is met with in some parts in great numbers.

Euphonia.—A genus of birds belonging to the conirostral tribe of the order *Passeres*, family *Fringillidæ*, and sub-family *Tanagrinæ*. There are several species, one of which, *E. Jamaica*, is a native of the West Indies, and is known there as the blue sparrow, or blue quit. It has a sweet note, is common about homesteads, lives upon fruits, and builds a snug domed nest of a globular form, about the size of an infant's head, and lined with cotton and the down of plants.

Euphorbia. *The Spurge.*—See EUPHORBIACEÆ.

Euphorbiaceæ. *The Spurge family.*—A nat. ord. of dicotyledonous plants, containing about 2,800 species distributed throughout a great number of genera. They are scattered over a great part of the globe, though they are most abundant in America and tropical climates. The species differ greatly in general form, some being simple herbs, others shrubs, and some growing to the height of lofty trees; while there are others again which have a very succulent nearly leafless stem resembling that of the cacti. Most of the plants of this order abound in a milky acrid juice, in which the peculiar principle resides which gives the *Euphorbiaceæ* uniform properties, though these subsist unequally in the different species. In some this milky juice merely produces a little irritation, while in others it acts as a vesicant when applied externally, and operates as a powerful cathartic when taken internally. The acrid resin, called *Euphorbium*, is the produce of two species of the typical genus *Euphorbia*, *E. officinarum*, and *E. antiquorum*, both natives of Africa. This resin is a powerful irritant, and causes great irritation of the mucous membrane when applied to the nostrils and eyes. It is *highly* poisonous if administered internally, and in consequence is not used, though it enters into the composition of several epispastics. The seeds of a European species, *E. lathyris*, the caper spurge, contain a powerful purgative oil, which has been recommended as a substitute for croton oil. The root of *E. ipecacuanha* is a powerful emetic, and has been occasionally substituted for the true ipecacuanha. The juice of several species growing in Africa, such as *E. heptagona*, *E. virosa*, and *E. cereiformis*, furnishes the Ethiopians with a mortal poison for their arrows; and the wild native of Brazil uses that of *E. cotinifolia* for the same purpose. The milky sap of *E. phosphorea* emits a phosphorescent light in a warm night in the forests of Brazil. Many other genera contain properties which render them either useful or dangerous to man. Such are the genera JATROPHA, which yields the manihot or cassava; RICINUS, or castor oil plant; CROTON and CASCARILLA; BUXUS, the box wood; and PEDILANTHUS, &c. Besides the irritant milky juice already mentioned, some other species possess the substance known as caoutchouc, and in a few, which have no milky juice, we find a colouring matter called turnsole. See CAOUTCHOUC and CROZOPHORA.

Euphotide.—A rock composed of diallage and felspar, imperfectly crystallized, and passing into compact felspar. It forms entire beds in the region of micaceous rocks, and is susceptible of taking a good polish; in consequence of which it has been employed as a stone for decorative purposes. It consists of silica, alumina, and oxide of iron, with some magnesia, soda, and potass. It is sometimes called diallage rock and gabbro.

Euphrasia (*εὐφρασία*, delight). *Eyebright.*—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, and containing a number of species scattered over the temperate parts of the globe, more especially those of the southern hemisphere. The common eyebright, the "casse-lunettes" of the French, *E. officinalis*, owes its English name to the high opinion in which its virtues in curing diseases of the eye were formerly held. Its leaves contain a minute quantity of tannin. This plant has a wide geographical range, being said to be a native of the heaths and pastures of Europe generally, the Himalaya Mountains, Cashmere, and all the north of Asia. It is very common in Great Britain.

Euplectella (*εὖ*, well; *πλέκω*, to plait).—A genus of sponges found in the Philippine Islands. They consist of a kind of hollow cylinder, a little curved, and having somewhat the appearance of a *cornucopia*. The wide part, however, instead of being open is covered, as is almost the whole surface, with a network of anastomosing fibres. At the extremity, these fibres are less regularly disposed than on the tubular part; and the openings left among them having the appearance of the rose of a watering pot, the typical species of the genus has been called *E. aspergillum*. The fibres of which it is composed are in great part siliceous.

Euryale (one of the Gorgons).—A genus of dicotyledonous plants belonging to the nat. ord. *Nymphæaceæ*. There is only one species, *E. ferox*, which is an elegant aquatic plant, with bluish-purple or violet flowers, nearly as large as those of the water-lily. The leaves are large, about a foot in diameter, and of an orbicular shape. The petioles and calyces are hispid with

stiff prickles, giving the plant, in consequence, a peculiar aspect. This elegant aquatic is a native of the East Indies and China, and may now be seen in great luxuriance in the Crystal Palace at Sydenham.

Euryale.—A genus of radiated animals belonging to the *Echinodermata*, and family OPHIURIDÆ.

Eurylaimus.—A genus of birds. See MUSCICAPIDÆ.

Euripterus.—A genus of fossil crustacea. See TRILOBITE.

Eusomphalæi (*εν*, good; *ομφαλος*, umbilicus).—A family of double monsters, belonging to the order *Autositarii*, and consisting of two individuals, joined together by the extremities only, each having its own umbilicus (hence the name), its own abdomen and chest. It is one of the families in which the smallest deviation from the normal structure exists, and the cases are rare. The individuals may be united together either by the lower or upper extremities, and they may live for many years. When the union takes place above the umbilicus, the individuals may be joined by the head, front to front. This case is called *Metopages* (*μετωπον*, front; *παγις*, united), and is very rare. Several cases, however, are on record; and one is detailed at length where two sisters of the human family were thus united, and lived for ten years. They were connected by the superior and external parts of the head, and were placed exactly opposite each other, chest to chest. They only saw surrounding objects from sideways; they could not lie down, nor rise up, nor walk, except together; and when one walked forwards the other was obliged to walk backwards. One of the sisters died at ten years of age; and it was then attempted to separate them, but the operation was unsuccessful. Occasionally it happens that when two individuals are united by the head, the forehead of one is joined to the occiput of the other. This case is called *Cephalopages* (*κεφαλη*, head; *παγις*, united), but is very rare, and the individuals seldom live long after birth. In this case the chest of the one is opposite the back of the other. The cases in which the union takes place below the umbilicus are called *Pygopages* (*πυγη*, buttock; *παγις*, united). Though rare, several instances are on record, both in the lower animals and in the human species. One instance of this kind, which made a great noise at the time, occurred in Hungary, where two sisters were united by the hips and part of the loins. They were born in 1701, and lived till they reached the age of twenty-two years. They were named Helen and Judith, and were different in temperament and character. One was taller, more beautiful, more active, more intelligent, and sweeter tempered than the other. They both died at the same time.

Euterpe.—A genus of palms, the species of which are lofty trees, and inhabit the West Indies and South America. The cabbage palm, *E. montana*, affords the natives of the West Indian islands an excellent vegetable. The terminal bud forms a white, sweetish mass, which, when boiled, somewhat resembles artichoke, or parsnip, and is a very wholesome article of food. The assai, *E. oleracea*, a native of South America, growing in swamps flooded by high tides, and reaching to a height of sixty feet, is used by the natives in the same manner; and the ripe fruits afford a favourite beverage, which is very much used in Para. To obtain this the fruit is steeped for some time in hot water, and when the outer pulp has become soft enough to rub off, the liquor is mostly poured away, fresh cold water is then added, and the fruit is rubbed and kneaded with great perseverance, till the whole purple covering has been rubbed off, and the greenish stones left bare. The liquid is now of a thick, creamy consistence, and of a plum colour, and is ready for use. The natives of Para generally take it with *farinha*, a substitute for bread, prepared from the mandweca root, and hundreds of the population make of this almost their chief subsistence.

Euxenite.—A mineral found at Jölster, in Norway, and containing a proportion of yttria in its composition. It occurs in brownish-black rhombic prisms, with a metallic lustre, and in thin splinters.

Evadne.—A genus of entomostracous crustacea. See CLADOCERA.

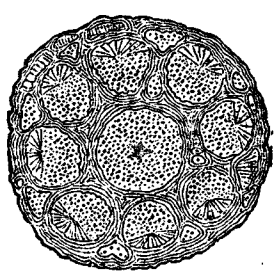
Excecaria.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*. The species called *E. agallocha*, a native of India and the Indian islands, is a small, crooked, stunted tree, and abounds in a virulently acrid milk. This juice acts as a powerful poison on the human system, and, we are told, produces ulcerations on the bodies of the wood-cutters wherever it touches. In some cases, sailors who have been sent ashore to cut wood, have lost their eyesight from its getting into their eyes. The wood called *Agallochum*, or aloeswood, is not the produce of this tree, though the specific name has been given to it apparently on that supposition. See AQUILARIACEÆ.

Exencephalæi (*εξ*, without; *εγκεφαλος*, the cavity of the brain).—A family of single monsters, belonging to the order *Autositi*, and containing those cases of monstrosity in which the brain, more or less malformed and incomplete, is situated outside the cavity of the cranium, which is itself incomplete, or more or less imperfectly formed.

Exocætus. *The Flying Fish.*—A genus of soft finned fishes belonging to the order *Pharyngognathi*, and family *Scomber esocidæ*, and distinguished by having pectoral fins of great size, and nearly equal to the body in length. Only two or three species are known, one, *E. exiliens*, living in the Mediterranean, and another, *E. volitans*, occurring abundantly in the Atlantic and Indian Oceans. The power of flight

possessed by these fishes is not very great, but they accomplish a distance of several hundred yards, and frequently spring as high as the deck of a large ship-of-war. They are very numerous in the open ocean; and nothing strikes the voyager more, at first entering the tropics, than to see whole flocks of this little fish, a little larger than our herring, spring from the sea like birds, and skim along to a considerable distance. Naturalists repeat, one after another, moving tales about the hard fate of these poor creatures. The voracious dolphins, albicores, and other large fishes, pursue them, they say, in the water with great fierceness, and the poor flying-fishes leaping out of the sea to escape their aquatic foes are pounced upon in the air by hosts of albatrosses, frigate birds, and large gulls, which are hovering about ready to devour them! Such to a certain extent may be the case; but we suspect these little winged aquatics enjoy the power their Creator has given them to take their short flights in the air, and from what we have often witnessed, without so much danger from their aerial foes as has been asserted.

Exogenæ (ἐξω, outward; γιννασιν, to produce). —One of the classes in the vegetable kingdom



Section of an Exogenous Stem.

synonymous with dicotyledones. The plants belonging to this class are called exogenous, because the woody matter of the stem is augmented by additions to the outside of that which is first formed near the centre, and which is the hardest. As long as they continue to grow, they add new wood to the outside of that formed in the previous year; and in many cases are easily recognized by the wood of each different year forming a distinct zone, so that a section of their wood exhibits a number of concentric circles. It is the largest class, and all the trees of cold climates, and the principal part of those of hot countries, belong to it. The number of exogenous plants is very great. Four-fifths of the natural orders are comprehended in this class, and nearly the same proportion of species. These, at a low computation, may be rated at 50,000 or 60,000; and a large proportion of plants useful to man are contained in it.

Exogonium.—A genus of plants. See CONVOLVULACEÆ.

Exostemma (ἐξω, outward; στεμμα, a crown). —A genus of dicotyledonous plants belonging to the nat. ord. *Cinchonaceæ*, and containing about a dozen species of trees and shrubs, natives of tropical America, and having lanceolate, oval, short-stalked leaves, and white or reddish flowers. The species are generally called *false Cinchonæ*, and their bark possesses a tonic and purgative quality; a circumstance which has caused them to be attempted to be substituted for the true cinchona. Notwithstanding the bitter taste and the febrifuge properties these trees possess, chemical analysis has shown that the bark does not contain either quinine or cinchonine. *E. Caribœum*, quinquina piton, or sea side beech, is the type, a species which is very common in the West Indies. It is a tree about twenty feet high, with a smooth bark, gray on the outside, and ovate-lanceolate, acuminated, glabrous leaves. The capsules, before they are ripened, are very bitter, and produce a sensation of burning itching, when applied to the nostrils and lips. The bark is bitter also, and its flavour is at first sweet, with a mixture of the taste of horse radish and aromatic oils, but becoming afterwards excessively disagreeable. When examined by the microscope, it presents innumerable shining crystalline points, which are supposed to be some principle peculiar to the bark. *E. Peruvianum* is a native of Peru, growing on the declivities of the Andes, between the river Chota and the village of Querocotilla, 3,000 feet above the level of the sea. It is a tree ten or twelve feet high, with ovate-oblong, acute leaves, rounded at the base, the upper sessile and cordate. The bark of this species also is very bitter, with a sweetish taste at first, and a nauseous smell. *E. souzanum*, quinquina de pianhi, is a native of Brazil, with obovate or ovate, acute and smooth leaves. The bark is bitter, and has been used as a substitute for Peruvian bark.

Explanaria.—A genus of corals. See ANTHOZOA.

F

Faba. *The Bean.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and of which the common bean, *F. vulgaris* (*Vicia faba* of some botanists) is a species. This plant is almost universally cultivated as an article of food for both man and beast. The flowers are remarkably sweet scented, a field of beans in full bloom perfuming the air for a con-

siderable distance. Many varieties are produced by cultivation, but it is difficult to say where the original stock sprung from. It is said to be found wild in Persia, not far from the Caspian Sea. The farina of beans contains a large amount of nutritious matter.

Fabaceæ. *The Pea and Bean family.*—A synonyme of LEGUMINOSÆ.

Faecula (*fæx*, sediment).—The meal of different plants—synonymous with *starch*. See AMYLUM and ARROW-ROOT.

Fagopyrum.—A genus of dicotyledonous plants belonging to the nat. ord. *Polygonaceæ*, and of which the common buck-wheat, *F. esculentum*, is a species. This plant (*Polygonum fagopyrum* of some botanists) is now naturalized in Great Britain, though it is understood to be a native originally of Persia and other Asiatic countries. From the East it was brought to Europe by the Crusaders, and in many parts of France it is known by the name of Saracen corn. It is cultivated in many parts of this country for pheasants and other game. In Belgium it is highly esteemed and very much cultivated, and in the United States of America, is greatly used as an article of food.

Fagus (φαγω, to eat). *The Beech.*—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, sub-order *Corylaceæ*, and consisting of a number of species which are for the most part tall and handsome trees, natives of Europe, North and South America, and Australia. The common beech, *F. sylvestris*, is the best known species—a tree varying from 60 to 100 feet in height, remarkable for its smooth thin bark, numerous wide spreading branches, and dense foliage, and growing not only in England and throughout Europe, but also in North America. The wood of the beech is valuable for many purposes. It is the hardest, when green, of any of our forest trees, and is especially useful where strength is required, and where the action of water is to be resisted. On the continent great quantities are used as firewood, and in France the wooden shoes, or *sabots* of the peasants are made of it in preference to any other kind of wood except walnut. The beech is a long lived tree, and one is shown in Windsor Forest which is said to have been in existence before the Norman Conquest. The fruit contains within a rough husk, a seed or nut which tastes somewhat like the hazel nut, and is a great favourite of squirrels. This *beech mast*, as it is called in England, forms an excellent food for swine, and an oil is procured from the nuts which is called beech oil, and is used for cooking and burning in lamps. Few trees are more ornamental to the park and the lawn than the beech, but its foliage is so dense that other plants will not thrive under it. Numerous fungi, however, grow on the stem, or on the ground under the trees. The common morel, a celebrated dainty, *Morchella esculenta*, and another species, *Helvella esculenta*, are the most remarkable of these. They grow under the trees and more particularly after they have been burned down. The birch-like or

Fagus sylvestris—The Beech Tree.

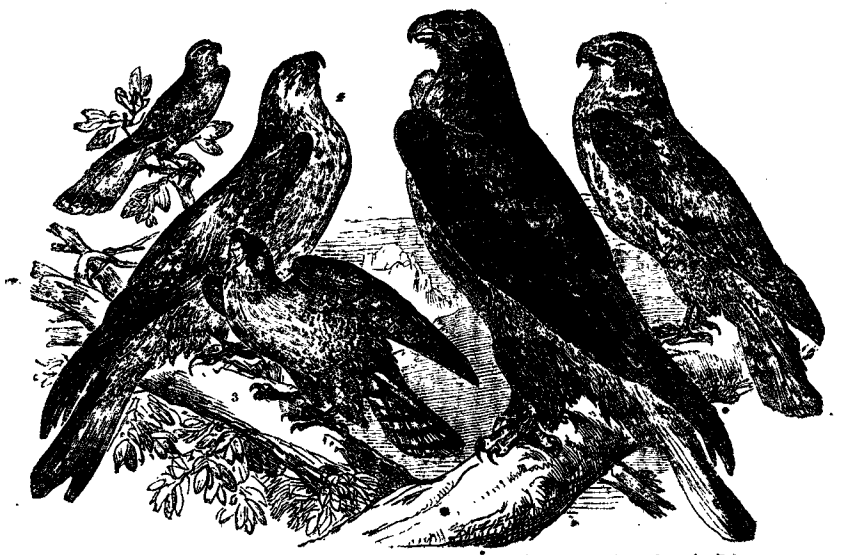
evergreen beech, *F. betuloides*, grows at Port Famine, Straits of Magalhaens, and in Van Diemen's Land, where it is called by the colonists the myrtle tree. It attains a large size, frequently measuring four feet in girth, is an evergreen species, and forms vast forests in Tierra del Fuego.

Fahlerz or **Fahlore.** *Gray Ore of Copper* or *Tetrahedral Copper Pyrites.*—An ore of copper of a gray colour, occurring massive and in tetrahedral crystals. There are two varieties, the one containing arsenic, the other antimony.

Fahlunite.—A mineral substance found in the mines of Fahlun in Sweden, synonymous with *Triclasite*, and composed of silica, alumina, oxide of iron, magnesia, a trace of manganese, and a large proportion of water. It is a hydrated silicate of alumina and iron.

Falco. *The Falcon.*—See FALCONINÆ.

Falconidæ.—A numerous family of birds belonging to the order *Accipitres*, or birds of prey. These birds have the head covered with feathers, and the eyebrows prominent, giving the eyes the appearance of being deep in the head. The beak is strong and hooked, and the claws or talons very sharp, strong, much incurved, and retractile. The species are numerous, and the family is divided into several sub-families—such as the eagles, see AQUILINÆ; the caracaras, see POLYBORINÆ; the buzzards, see BUTEONINÆ; the kites, see MILVINÆ; the sparrow hawks, see ACCIPITRINÆ; the harriers, see CIRCINÆ, and the falcons, see FALCONINÆ.



1. *Buteo vulgaris*—Buzzard. 2. *Aquila chrysaetos*—Golden Eagle. 3. *Falco peregrinus*—Peregrine Falcon. 4. *Milvus regalis*—Kite. 5. *Tinnunculus alaudarius*—Kestrel.

Falconinæ. *The Falcon family.*—A sub-family of birds belonging to the order *Accipitres*, and family *Falconidæ*. The falcons are characterized by their beaks being curved from the base, and having on the margin one or two strong teeth on each side. Their wings are of considerable length, in many as long as the tail, and the second quills are the longest. Of all the birds of prey the falcons are the most beautifully formed, the most courageous, and the most active. They unite in themselves all the qualities possessed by the other sub-families of the *Falconidæ*. They are able to support a lofty and long sustained flight. Their beak enables them to tear their prey to pieces better than any others of the order to which they belong, and their claws, long, sharp, and curved, render their power of prehension unfailing. The colour of their plumage is more brilliant than the other birds of prey, but they are the smallest of the order. They are solely and absolutely carnivorous, preying only upon live animals, and refusing carrion even when pressed by hunger. Their flight is very rapid, and a falcon has been known to fly from Malta to Paris, a distance of 300 leagues, in one day. They are solitary birds, living only in pairs, except at such times as they are obliged to migrate in search of food, as for instance when a very severe winter has destroyed the animals upon which they prey. The species are all diurnal, hunting their prey during the day, except one species, *F. vespertinus*, which seeks its food in the morning and evening. Their habitation is generally in the forests, or on rocky and naked mountains, and they build their nests in crevices of rocks, on lofty trees, or on old ruins. Their prey consists chiefly of birds on the wing, which they seize by means of their long claws, but they capture quadrupeds also, and even attack some of the larger animals, lighting upon their neck, and tearing their eyes out with their powerful and sharp beaks. Some of them also feed upon live fish which they pounce upon with such quickness that they seem scarcely to ruffle the surface of the water. They generally retire to a corner to eat the prey they have caught, and should this be a bird, they first of all strip it of its feathers. The cry of the falcons is sharp, shrill, and disagreeable. They are long lived birds, and one or two instances are on record where they have been known to have lived 120 years. Their courage and boldness are such that the jerfalcon will even combat the eagle. Few birds, indeed, dare attack them. Crows, however, and jays annoy them, and martins and weasels often destroy their eggs and young. Their nests are simply constructed, their eggs are four or six in number, and the young are a considerable time before they are able to leave their parents, and procure food for themselves. Most of the falcons are birds of passage, and their geographical distribution is very wide. They range from the equator to the poles, and representatives of the family are found in all parts of the world. Before the introduction of fire-arms and even for some considerable

time after, falcons were much employed by the wealthy proprietors and nobles of Europe as birds of chase, and the art of falconry was one of great importance in the middle ages. Now, however, the sport has fallen into complete disuse in all countries, and the birds are only regarded as fit objects for destruction. A considerable number of species have been described, nine of which are European. The jerfalcon, *Falco Gyrfalco*, is

Falco Gyrfalco—The Jerfalcon.

generally considered the boldest and most beautiful of the family, and next to the eagle is the most formidable, active, and intrepid of all rapacious birds. It was much esteemed for falconry, and it boldly attacks the largest of the feathered race. The jerfalcon is a native of the cold and dreary regions of the north, and is found in Iceland, Russia, Norway, and Baffin's Bay. The peregrine falcon, *F. peregrinus*, is less than the preceding, but in its full growth and plumage is a very fine-looking, strong, and bold bird. It is a general inhabitant of Europe, is found in the extreme parts of both North and South America, occurring in Hudson's Bay and the Straits of Magalhaens, and is seen in Australia and the Cape of Good Hope. The peregrine falcon was highly esteemed in falconry. It is a native of Great Britain, making its nest on high rocks in various parts both of England and Scotland. Two or three noble species of falcons are found in Australia.

Farina.—A term synonymous with FÆCULA. A substance called *fossil farina* or mountain milk, is found in China, and appears to be composed of fossil siliceous *Infusoria*.

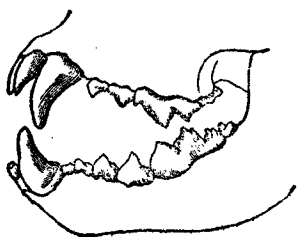
Fasciola. *The Fluke.*—A genus of *Entozoa*. See DISTOMA.

Faujasite.—A hydrous silicate of alumina; composed of silica and alumina, with a little lime and soda and a considerable proportion of water. This mineral occurs crystallized in the form of an octohedron, and though fragile, is so hard as to scratch glass. It is found in amygdaloid at Kaiserstuhul in Breisgau.

Fauna.—A term employed by naturalists to designate a work in which are arranged and described all the animals belonging to a particular region or country, or to express the whole of the members of the animal kingdom living in a particular district. We speak, for instance, of the British fauna, and the extinct species are separated from the recent, under the names of recent fauna and fossil fauna. The word is derived from the *Fauni*, who, in ancient mythology were supposed to be the patrons of wild animals, and is in zoology what the word *flora* is in botany. See FLORA.

Fayalite.—A mineral substance consisting of silica, alumina, and iron, found in the debris of trachytic rocks in the island of Fayal in the Azores.

Felidæ. *The family of Cats.*—A numerous family of animals belonging to the class *Mammalia*, and order *Ferœ*, or rapacious beasts. They have six cutting teeth in each jaw, and three kinds of acutely lobed grinders. The carnivorous tooth is elongated with an internal lobe, and differently shaped from the tubercular

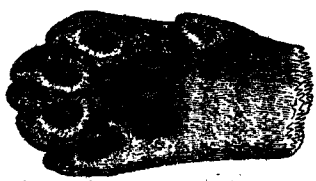


Carnivorous Teeth.

grinders. The soles of the feet are often covered with hair, especially near the heel, where it is not applied to the ground in walking. Their head is roundish, and the end of their nose is slightly mobile. This family is divided into several sub-families or tribes, differing in many points from each other. Such are the true cats, see FELINÆ; the hyenas, see HYÆNINÆ; the dogs, see CANINÆ; the civets, see VIVERRINÆ; and the weasels, see MUSTELIDÆ.

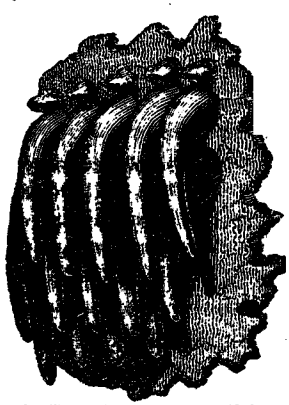
Felinæ. *The Cat family.*—A sub-family of animals belonging to the order *Ferœ*, or rapacious beasts, and family *Felidæ*. The animals of this family have the limbs nearly equal, with five toes on the anterior and four on the posterior feet, all armed with sharp retractile claws; their head is short and rounded, and they have four grinders above and three below. This sub-family contains the cats, lions, tigers, leopards, and lynxes, and of all the carnivorous animals is the tribe in which the organs of destruction reach their highest development. They are amongst quadrupeds what the falcons are amongst birds. A set of sharp incisive teeth, powerful and large canines, and pointed tuber-

cular molars, set in two strong jaws, worked by powerful muscles, form a most formidable apparatus for tearing and lacerating their prey. Their extremities, provided with five toes anteriorly and four posteriorly, each toe armed with a strong hooked sub-compressed claw, and worked by highly developed muscles, are equally well adapted for seizing and rending their victims. The whole family are essentially carnivorous, and when in a state of nature they will refuse all vegetable food, and eat only flesh of animals which they themselves have killed. By a beautiful conformation, the claws are able to be retracted within a fold of the integument, and as when the animals are in motion the soft parts of the feet only are brought into contact with the ground, their tread is noiseless. Gliding along,



Under surface of foot of family *Felida*.

with this stealthy silent pace till couched within proper distance, they spring with fearful velocity and force upon their unsuspecting prey. These, in general, are only made aware of their danger by the terrific roar which their enemy utters as it makes its sudden bound, while at the same instant they are struck with a blow from its deadly



Papillæ of Lion's Tongue magnified.

talons and feel the murderous gripe of its teeth. The senses of smell and hearing are both well developed in the cat family; and that of sight is very acute, and equally adapted for night and day. The animals are in general furnished with long whiskers, and these bristles form delicate organs of touch and feeling. The tongue is rough with horny papillæ directed backwards, which structure enables the creatures to scrape off any remnants of flesh adhering to the bones of the animals upon which they feed. In their osteological structure the species of this family vary very little, except in size—and accordingly in the works of the older zoologists they were all made to enter into the one genus, *Felis*. The typical form of the family is the lion, popularly termed the king of beasts. Formerly only one species was admitted by zoologists, but from later observations it would appear that there are several. In the earlier ages lions were found in Europe, but now they seem confined to Africa and Asia. Even in some of these countries they are retreating before the presence of man. From the frequent allusions made to them in the Holy Scriptures they appear to have been tolerably abundant in Syria and Palestine. At the present day they have disappeared from these territories, as well as from Egypt. The African lion, *Leo Africanus*, is the finest, most powerful, and by far the most ferocious of all the varieties of the lion genus. Volumes might be filled with thrilling anecdotes of this noble but terrific animal. Three varieties are mentioned: the Barbary lion, from Barbary and North Africa; the Senegal lion, from Senegal and West Africa; and the Cape lion, from South Africa and the Cape of Good Hope. The Asiatic lion, *Leo Asiaticus*, is inferior in ferocity and courage to the African species, and is more frequently a native of the jungles. The Bengal lion is the variety best known: and the grand Asiatic lion hunts of former times are too well known to render any description of the noble subjects of this chase at all necessary. Another variety is called the Persian, or Arabian lion, and is distinguished by the pale Isabella colour of the fur. The maneless lion of Guzerat, *Leo Goojratensis*, is distinguished from the other species of lions by being nearly destitute of that appendage, the mane, which is such a striking feature of the African and Bengal lions. The species is found in Guzerat along the banks of the Sombermuttee, near Ahmedabad, extending through a range of country about forty miles in length. The natives call them by the name of Ontia Baug, or the camel-tiger; they appear to be rather numerous in the districts mentioned, and prove very destructive to cattle. The popular character of the lion is that of equal strength and generosity of disposition—a character which has been given to him by poets and writers of fiction, repeated by zoologists in eloquent language, such as Buffon, and which has, amongst general readers, passed into a bye-word. Hailed by the name of "king of beasts," "monarch of the forest," &c., and considered as the emblem of majesty and might, the lion is the most popular of all quadrupeds, as the eagle is of all birds. It is the symbol of the British nation, and is borne on the royal arms, of which it forms one of the sup-

porters, and which it surmounts as the crest. The character, however, which he popularly bears is one of great exaggeration. "It seems almost sacrilegious to dissipate the glowing vision which Buffon has raised; but if there is any dependence to be placed on the observations of those travellers who have had the best opportunities of judging, and have the highest character for veracity, we must be compelled to acknowledge that Buffon's lion is the lion of poetry and

1-1. *Leo Barbarus*—The Lion, male and female. 2. *Tigris regalis*—The Tiger. 3. *Leopardus varius*—The Leopard. 4. *Caracal melanotis*—The Caracal.

prejudice, and very unlike the cautious lurking savage that steals on its comparatively weak prey by surprise, overwhelms it at once by the terror, the weight, and the violence of the attack, and is intent only on the gratification of its appetites." The early writers on America mention lions as natives of that part of the world; and Hernandez, in 1651 mentions the animal so called, as the "Leo Americanus." This animal is the puma, the *Felis concolor* of the older zoologists, *Puma concolor* of more recent writers. The puma, or cougar, the panther of the Anglo-Americans, is a native of the American continent, and, at one time, was found in existence from Canada to Patagonia. It has now almost entirely disappeared from North America; and though still abundant in many portions of South America, is daily becoming more scarce as civilization advances. It is the largest species of the feline family found in the New World. It is about five feet from nose to tail, this latter organ itself being about 2½ feet in length, and is of a brownish-red colour, or when fully mature of a silvery-fawn. The puma is very destructive, climbs trees with great facility, and is said to lie in wait upon one for the deer to pass and then to drop upon them, lighting upon their shoulders and drawing back the poor victim's head with one of its paws till the vertebræ break. Though of a rather savage disposition in its native wilds it is readily tamed when in captivity; its manners then resemble those of the cat. Like it, it is fond of being noticed, raises its back and stretches its limbs beneath the hand that caresses it, and expresses its pleasure by the same quiet and complacent purring. Next to the majestic lion in strength and power, superior in beauty, but of a more ferocious and blood-thirsty disposition, is the tiger. There is only one species: the magnificently beautiful and well known royal tiger, *Tigris regalis* (*Felis tigris*, of Linnæus), a native of the warmer parts of Asia, and chiefly of India and the Indian islands. The colour of the tiger is of a bright orange-yellow ground; the face, throat, and under side of the belly being nearly white; the whole elegantly striped by a series of transverse black bands or bars, which form a bold and striking contrast. He has no mane, and his whole frame, though less elevated than the lion, is of a more graceful make. The average length of the Bengal tiger is about eight feet, and it stands three or four feet high; specimens, however, have occurred from fifteen to eighteen feet long. It is much more abundant in Hindostan than the lion, and in many parts is the scourge

of the country. The bound with which the tiger springs from his ambush, and throws himself upon his prey, is wonderful, and the distance which he clears is immense. A man is as nothing in his gripe, and he will even carry off a buffalo with apparent ease. In the East the tiger is considered as the emblem of power. In China the justice seats of the mandarins are covered with tigers' skins. The tiger soldiers of Hyder Ali and Tippoo Saib were amongst the choicest of their troops; and a tiger's head, gorgeous with jewels, formed the principal ornament of these potentates' throne. The leopards, panthers, and tiger cats, are now included in the genus *Leopardus* of modern authors. These animals have long cylindrical tails, and their skin is in general covered with spots: hence they are often called spotted cats. Unlike the true cats, the leopards have a round instead of a long pupil. The leopard or panther, *Leopardus varius* (*Felis Pardus*, Linnæus, and *F. Leopardus*, Gmelin), is a native of both Asia and Africa, and is finely marked with spots. The general length of this animal is about four feet from nose to tail, and the tail is about 2½ feet more. Its body is possessed of great flexibility, and it can climb trees, take surprising leaps, swim, or crawl like a snake upon the ground, with equal facility. It is a fierce and rapacious animal; and, it is remarked, though ever devouring, always appears lean and emaciated. The leopard and panther have generally been considered distinct: the former animal having numerous small spots congregated close together, while the latter has the spots much larger, open, and the inner surface darker than the outer. The skins vary, however, so much, the two sides of the same animal even sometimes being dissimilar, that they are now considered identical. The ounce, *Leopardus uncia*, is easily known by the thickness of its fur, the pale colour and irregular form of the spots, and by the great length and thickness of the tail. It is nearly as large as the leopard, and lives in the mountainous regions of Asia. The jaguar, *Leopardus Onca*, is a native of America, inhabiting chiefly Brazil and Paraguay. It is more robust and of a stouter form than the leopard, and, when full grown, measures from four to five feet from the nose to the root of the tail. It is strongly built, and is a fierce, voracious, and destructive animal. Large and small quadrupeds, monkeys, cattle, birds, fish, and reptiles, all fall victims to its ravenous appetite; no living animal seems to come amiss, though he seldom, if ever, ventures to attack man. The jaguar is said to be very fond of turtles, and as it turns more of these creatures than it can devour at one meal, the Indians often profit by his dexterous cunning. At the time of Humboldt's visit to South America, they were so numerous and so destructive to the herds of sheep and cattle, that great numbers were killed by the natives. Upwards of 4,000 were said to be annually put to death, and 2,000 skins were exported every year from Buenos Ayres alone. Several other species of the genus *Leopardus* are described, such as the ocelot, *L. pardalis*, one of the most beautiful of all the tiger cats, nearly three feet long, elegantly marked with numerous longitudinal bands and elongated spots with black margins, and a native of Mexico, Paraguay, and Peru. The serval, *L. Serval*, about two feet long, with a skin marked with rather small black spots, and living in South Africa. The chati or chibeguazu, *L. mitis*, about a third larger than the domestic cat, with much of the manners and form of that animal, and inhabiting South America. The pampas or jungle cat, *L. Pajeros*, about twenty-six inches long, of a stouter make than the wild cat, but about the same size, and found common over all the great plains which compose the eastern side of the southern part of South America. The rimau-dahan, *L. macroscelis*, about three feet long, elegantly marked, of a more playful and gentle disposition than most of the other tiger cats, and a native of the island of Sumatra; with several others, from both the Old and the New World. The hunting leopard, cheetah, or hunting cat, *Guepards jubata* (*Felis jubata*), unites to the general habit of the cats some of the peculiarities of the dog, and appears to be intermediate between the leopard and the hound. It has the long tail of the cat, but its legs are more elongated, and appear better fitted for strong muscular exertion than for active and long continued speed. In length it is about equal to the leopard, but stands higher on its legs. The cheetah is a native of both India and Africa, and in the former country is tamed and employed in the chace. They are chiefly used for hunting antelopes, and for this purpose are carried to the field hooded and chained in low cars. As soon as the hunters come within sight of a herd, the cheetah is unchained, its hood is removed, and the game is pointed out; approaching cautiously towards the antelopes till it comes within a short distance of them, it suddenly bounds forwards, pounces upon its quarry, strangles it instantly and drinks its blood. The lynxes are distinguished by having short tails, tolerably large heads, and long ears, the ends of which are pencilled, or furnished with a tuft of lengthened hairs. There are several species described, and are referred to the genera *Lyncus* and *Chaus*. The common, or European lynx, *Lyncus Lynx* (*Felis Lynx*, Linn.), is about three feet long, with a fur of a dull reddish-gray above, with oblong spots of reddish-gray upon the sides, and is a native of Europe and the north of Asia. The species varies much, and some naturalists even discriminate two or three. The variety, or species, inhabiting southern Europe is the *L. pardinus*, and is found in Spain, &c., whilst the true lynx inhabits the north of Europe and Asia. The lynx feeds upon small birds and quadrupeds, and climbs trees in search of them. The fur is

much esteemed, and considerable quantities are imported from Moscow; the farther north, and the colder the climate, the more valuable is the fur. The fur of the Canada lynx, *L. Canadensis*, is perhaps even more valuable than that of the European species; it forms a considerable article in the fur trade, and the Hudson's Bay Company annually import to this country from 7,000 to 9,000 skins. This species is a timid animal, preying chiefly upon hares. The flesh is eaten by the Indians, and is said to be white, tender, and resembling that of the American hare. The chaus, or booted lynx, *Chaus lybicus*, is about three feet long, including the tail, which is slender, and about 13½ inches in length, and inhabits Africa, from Egypt and Barbary to the Cape of Good Hope, and the south of India; it preys upon birds and small quadrupeds, but does not disdain carrion. The caracal, *Caracal melanotis* (*Felis Caracal*), is about two feet long, with a tail ten inches in length. It is found living throughout the whole of Africa, India, Persia, and Turkey; it preys upon small quadrupeds and birds, and is said to hunt in packs like the wild dogs. It follows the lion, and other large beasts of prey, for the purpose of feeding upon what they leave, and is sometimes called the "lion's provider." The true cats are now the only species of the restricted genus *Felis*. The common domestic cat, *Felis domestica*, is too well known to need description, though, as is the case with most of our domestic animals, the source from which we have derived it is still doubtful. Some naturalists have believed it to be the wild cat, but the prevailing opinion now is that it comes from Egypt, and that the parent is the *Felis maniculata* of Rüppel. The domestic cats of the Egyptians as preserved in their mummies, and the representations on their tombs appear to agree with this species still found in Nubia, and most writers at the present time agree in the belief that we are indebted to the Egyptians for our useful, gentle, and domestic animal. The Latin name for cat, *Cattus*, is retained in almost all the languages of Europe. In English, Welsh, Spanish, French, German, Dutch, Danish, Italian, Portuguese, and Swedish, the word is nearly the same. The varieties of the cat are numerous. The wild cat, *Felis Catus*, is a stronger and more robust animal than the domestic cat, and is found in all the wooded countries of Europe. It is larger in cold countries, and its fur is there held in higher estimation. It was formerly plentiful in Great Britain, and was at one time considered a beast of chace. It is still common in the north of Scotland and in Ireland. It is the fiercest and most destructive animal we possess, and makes great havoc amongst poultry, lambs, and kids. It multiplies as fast as our common domestic cat, and frequently breeds with it. Numerous fossil remains of animals belonging to the feline family have been discovered in the tertiary formations. Four species appear to have existed in this country—two of which must have at least equalled the tiger in size, and from their form of dentition surpassed him in ferocity. These are the great cave tiger, *Felis spelæa*, and *Machairodus latidens*.

Felis. *The Cat.*—See FELINÆ.

Felspar.—A mineral which occurs in every part of the world, composing about forty-five hundredths of the surface of the globe, and forming one of the constituents of granite. It consists of silica, alumina, and potash, with a trace of soda. There are many synonymes for this kind of mineral, and many varieties of it are found, varying in crystallization, cleavage, and composition. *Adularia*, a mineral found on Mount Adula and Mont St. Gothard, is very translucent, passing into blue, green, or gray, with a pearly lustre, and the variety called *moonstone*, from Ceylon, reflects when polished a variegated surface. *Aventurine felspar*, or *sunstone*, is a variety with micaceous matter imbedded, giving a fine lustre. *Orthose*, or ordinary felspar, is a silicate of alumina and potass. *Albite* is a silicate of alumina and soda, and enters into the formation of greenstone. *Labradorite*, Labrador, or opaline felspar, which is remarkable for reflecting, in certain positions, a great variety of colours, as blue, green, yellow, red, and brown, in iridescent forms, is a silicate of alumina and lime with soda. *Ryacolite*, or glassy felspar, is a silicate of alumina and potass with soda. *Amansite* or *Petrosilex*, is the name given to those minerals which consist of felspar mixed with other minerals, and is an impure variety of felspar. Felspar is used extensively in the manufacture of porcelain. The clay considered the best for this purpose is the result of the decomposition of felspar, and is prepared artificially in Cornwall by running a stream of water over decomposed granite, which carries with it the finer particles of felspar, and is then received into catch pools or ponds, where it is allowed to subside. The water is then run off, leaving a fine sediment, which is removed, and exposed to the atmosphere for four or five months, when it is ready for export. This clay is called kaolin, and is composed of silica, alumina, a small portion of peroxide of iron and water.

Feræ. *The Rapacious Beasts.*—An order of animals belonging to the class *Mammalia*, and characterized by having distinct and well defined cutting, canine, and grinding teeth, placed in a regular uninterrupted series. The feet are formed for walking, and are furnished with claws. This order contains several large families, such as the cat family, FELIDÆ; the bears, URSIDÆ; the moles, TALPIDÆ; the kangaroos, MACROPIDÆ (according to many naturalists); and the seals, PHOCIDÆ.

Feronia.—A genus of dicotyledonous plants belonging to the nat. ord. *Aurantiaceæ*. The species are trees, and grow in India. The ele-

phant apple, or wood apple, *F. elephantum*, is a native of the Coromandel coast, and has a large fleshy fruit which is spheroidal, rugged, and often warted externally, and is eaten by the natives. The young leaves when bruised have a fragrant smell like that of anise, and are considered by the native practitioners of India stomachic and carminative. A clear white gum like gum arabic may be procured from the tree, and when an incision is made into the trunk a transparent oily fluid exudes which is used by painters for mixing their colours. The wood of the tree is durable, white, and hard.

Ferrum. *Iron.*—A metal rarely found pure in a state of nature, but occurring in all rocks, in different forms, in great abundance. It is the most common and is without doubt the most useful to man of all the metals in existence. It surpasses all others in tenacity and hardness, and in elasticity when in the state of steel. Its ductility is greater than silver, gold, or copper, and it may be drawn out into wire as fine at least as a human hair, and its tenacity in that form is so great, that a wire 0·078 of an inch in diameter is capable of supporting 549 lbs. avoirdupois without breaking. Known from all antiquity, the art of extracting and working it has followed step by step the progress of civilization. When pure, iron is of a clear metallic gray colour, with a lustre of silver. Its specific gravity is about 7·843. It is attracted by the magnet, and is itself the substance which constitutes the loadstone. It fuses only at a high temperature, and oxidizes easily in a moist atmosphere, becoming red. Native iron is rarely found in a free state, except occasionally in the state of meteoric iron, when it occurs either in grains in those stones called meteorolites, or in isolated masses found in various parts of the world, as Siberia, South America, and in Senegal in Western Africa. Meteoric iron is always found in combination with a small quantity of nickel. It is chiefly in combination with other substances that iron is found, as sulphur, oxygen, and various acids, &c. Combined with sulphur, it forms what is well known as iron *pyrites*, or the bisulphide of iron, a substance very extensively distributed in nature, though rare in large masses. It occurs abundantly in the coal formations, from which it is obtained for the manufacture of sulphuric acid. Combined with oxygen, it forms the oxide of iron, occurring either in masses or in powder. Oxide of iron is chiefly found in the rocks of the primitive formation, and is disseminated in the form of crystals in schistose rocks, and in masses in granite and serpentine. The *peroxide* of iron occurs abundantly in nature in the form of *hæmatite*, and when freshly precipitated, constitutes the best antidote to arsenic. The *protosesquioxide* occurs abundantly in nature also, especially in Sweden, and it is from this kind of iron that the best steel is procured. In combination with carbonic acid it forms the carbonate of iron. The valuable ore, called clay ironstone, is a carbonate of iron mixed with clay and carbonaceous matter. This ore occurs in immense quantities, is the chief kind found in Great Britain, and is that from which British iron is obtained. The kind called *black band*, contains a quantity of coal in its composition. In combination with phosphoric acid it forms the phosphate of iron, which is found either in crystals or in small nodules. The chief variety of this kind is *vivianite*, or the blue phosphate of iron, and is used for painting, either in oil or distemper. The chief ores used for obtaining iron are the oxides and the carbonate; and the theory of the production of this metal consists in removing the oxygen from the oxides by charcoal or coal, and the extraction from the carbonate of carbonic acid in the first instance, and then of the oxygen. As procured in this country from the clay ironstone or the carbonate, the process consists of four stages. *First, Decarbonating* or *calcining*, that is, mixing a certain amount of coal with the ironstone in heaps, and allowing it to burn slowly. *Second, Deoxidating* or *smelting*, that is, submitting the roasted ore, mixed with coal and limestone, to an intense heat in the blast furnace till it is melted. This fluid substance is run off into small canals, and in that state, when cool, is called pig or cast iron. *Third, Decarbonizing*, or *refining*, that is, exposing this cast iron mixed with coke to an intense heat for two or three hours in the refining furnace. By this process the carbon still remaining in the pig iron is expelled, and the melted mass, when drawn off and cooled by water poured upon it, becomes very hard, and is called white cast iron. *Fourth, Puddling*, that is, exposing this white cast iron to a still greater heat in a reverberatory furnace, and keeping it continually stirred by a long iron instrument. It then becomes wrought iron. Steel is made from this kind, by placing it, surrounded with finely powdered charcoal, in a furnace covered up with sand, and heated intensely for a week or ten days. The carbon unites with the iron and forms a carbide of iron or steel. The quantity of iron fabricated in Europe is immense, and the value of this produce exceeds that of all the mines of gold and silver of America. In England alone the quantity is very great, and the exports in proportion. In 1850, the quantity of British iron exported amounted to 788,423 tons, and the declared value of the exports of that year amounted to £5,350,056! The quantity of pig iron produced in Great Britain is supposed to be about 1,900,000 tons annually, which, at the average of £5 a ton, would be equal in amount to £9,500,000 a-year. Adding the additional labour expended in converting it into bar iron, bolts, rods, &c., of £4,500,000, it would be worth in all about £14,000,000 a-year. The quantity of coal required for making this iron amounts to 10,650,000 tons. In 1854, the coal and iron works of the West of Scotland alone, produced

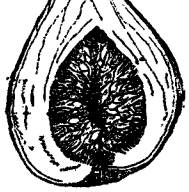
a sum to the establishments connected with them, of no less than £4,872,866; gave employment to 33,908 persons, who received wages to the amount of £1,973,937.

Ferula.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, comprising a number of species which are natives of Europe bordering upon the Mediterranean, and of the East. They are herbaceous, with a thick root and a thick stem, the centre of which is filled with a spongy substance. The typical species is *F. communis*, the spongy matter in the stem of which is used in Italy as amadou; and it is in the hollow stems of this plant that valuable MSS. are kept in the East. The gum resin, well known as assafœtida, is the produce of a plant which has generally been referred to this genus, though lately it has been described as belonging to the genus *Narthex*. This plant, *Narthex*, or *Ferula Assafœtida*, is a native of Persia and Scinde, near the mouth of the Indus, and is obtained from incisions made in the root, the juice which flows from these wounds being dried in the sun. Assafœtida, called also "stercus diaboli," is of a bitter taste, is very acrid, and its odour is very fetid and resembles garlic. The collecting this gum gives employment to the inhabitants of whole villages, and it is imported to this country in masses of the consistence of wax. In Great Britain it is only used in medicine, but in ancient Rome it was much esteemed, and is so at the present day in Persia and India, and even in France and Italy it is much employed as a condiment. About 9,000 lbs. are annually imported into this country from Bombay and Calcutta. An inferior sort of assafœtida is the produce of the species *Ferula Persica*, and the gum called sagapenum is procured from another species which is not well known. Gum ammoniacum is also said to be obtained from a species of ferula, *F. ammonifera* of some botanists, and it probably is, though the principal supply of this substance is from a species of *Dorema*. See DOREMA.

Festuca. *Fescue Grass.*—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ* or *Grasses*, and containing several species which are of considerable agricultural importance. They are abundant in dry, sterile places in the temperate parts of the northern hemisphere. About eighty species have been described. *F. pratensis*, or meadow fescue, is one of the best, and produces an excellent pasture. *F. ovina*, or sheep's fescue, is much esteemed by sheep, and forms, in a great measure, the fine turf of our dry hilly pastures.

Feuillea.—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*, and named in honour of the traveller in Chili, *Feuillée*. The species are natives of the tropical regions of America, and most of them are climbing shrubs. *F. trilobata* is a native of Brazil, and is the celebrated kandirhoba or ghandirhoba, which is held in great repute as an antidote to various poisons, animal and vegetable. The seeds act with great rapidity as an emetic and purgative. The fruit is as large as an apple, and from some fancied resemblance is called the shaving box.

Ficus. *The Fig.*—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and sub-order *Moreæ*. The species of this genus are of considerable number, and all tropical or inhabitants of warm countries. Some are small plants creeping upon the surface of rocks and walls, or clinging to the trunks of trees like ivy, while others are amongst the largest trees of the forest. The shade cast by their leafy heads is the subject of admiration amongst all travellers in hot climates. They are especially remarkable for throwing out roots from their branches, which after they have reached the ground and established themselves there, increase rapidly in diameter, produce other branches, and thus contribute to extend an individual over a considerable space of ground. Such is the mode of growth of the banyan tree of India, *F. Indica*, which spreads to such an extent as to afford shelter sufficient for a regiment of cavalry. Most of the species abound in a milky juice containing caoutchouc, and the greater portion of the substance of this name, imported from India, is the produce of *F. elastica*, growing abundantly in the mountains of Nepal. This tree has lately been found by Dr. Vogel in Africa, in the kingdom of Bornu, but he found that the natives were ignorant of the nature and use of the products. The pippul tree, or sacred fig of India, *F. religiosa*, is a large tree, much venerated by the Hindoos, and is common in every part of India, where it is planted for the sake of its extensive dark grateful shade. In like manner the sycamore fig, *F. Sycomorus*, a large tree found in Egypt, is planted there extensively for the sake of the shelter afforded by its widely spreading branches. It is probably the sycamore tree of the Bible. The fruit of several species of *Ficus* is eatable. It consists of a succulent hollow receptacle, on the inside of which are placed the flowers, male and female, mixed indiscriminately, all of which are united in one mass to form the fruit. This is shown in



Inflorescence of Fig—*Ficus Carica.*

the common fig, the fruit of *F. Carica*. The tree itself is a small crooked tree, and the fruit

——————, axillary, and more or less pear-shaped, succulent, sweet, and pleasant to the taste. In Greece, Spain, Naples, and in Asia Minor, figs form an important part of the people's food. They become more nourishing when dried, and in this state they form a considerable article of commerce. In 1840, the importation to this country of dried figs amounted to about 20,000 cwts.

Filaria. *Thread Worm.*—A genus of worms belonging to the class *Entozoa* and order *Nematoidea*. The genus forms the type of the family *Filariadæ*. The species are worms of a very long and slender form, and have been compared to threads, hence the name. They are cylindrical and attenuated at both extremities, with a round or triangular mouth at the anterior extremity. They inhabit different animals, and different parts of the bodies of these. Some live in the subcutaneous cellular tissue of man, as the guinea worm, *F. Medinensis*. This worm is found in hot climates infesting the natives of Africa, Arabia, and India. It penetrates the skin and raises a tumour underneath, which is painful and attended with danger. The method of extracting them is simple. Seizing hold of the extremity, it is pulled some way out, then rolled upon a piece of stick, and each succeeding day this stick is rotated several times, thus pulling the worm out by degrees. Two other species are found in man, one infesting the bronchial tubes, the other the eye. Various quadrupeds, several birds, reptiles, and fishes, and many insects and mollusca are subject to attacks of these parasites. It is possible that, like the hair worm, *Gordius*, the filariæ are free at one time and parasites at another.

Filices. *The Ferns.*—A family of plants. See ACROGENÆ.

Firola.—A genus of gasteropodous *Mollusca* belonging to the order *Nucleobranchiata*, and forming the type of the family *Firolidæ*. The species are elongated, gelatinous, transparent animals, often terminated posteriorly by a more or less lengthened tail, which is sometimes pointed. The nucleus is protected only by a membrane. The firolæ are very common in the tropical seas, and in the Mediterranean, but are so transparent that sometimes they can scarcely be seen. They swim with their foot upwards.

Fissirostres.—A tribe of birds belonging to the great order *Passeres*, and characterized by having a short, broad, flat beak, very deeply cleft, and short, weak feet. As exemplifications of the tribe we may refer to the HIRUNDINIDÆ or swallows, and the CAPRIMULGIDÆ or goat suckers.

Fissurella (*fissura*, a fissure). *The Key-hole Limpet.*—A genus of shells. See FISSURELLIDÆ.

Fissurellidæ.—A family of gasteropodous *Mollusca* belonging to the order *Phytophaga*, and containing a number of shells which closely resemble in external appearance the limpets, *Patella*. The animals, however, differ considerably; f instance, the posterior opening or anus is situat directly in the centre of the body instead of one side, and corresponds exactly in the gen *Fissurella*, which is the type of the family, wi a slit or fissure in the centre of the upper part the shell, and which is the chief character of t genus. The animal is generally too large to entirely contained within the shell, and in t genus *Fissurellidea*, the disproportion between t two is so great that the shell appears to be almo rudimentary, and the fissure on the summit proportionally larger than in the other gene and species. In *Fissurella* proper, the fissure central and oval, with a constriction in t middle, which gives it the appearance of a ke hole, hence the English name. In *Macrochism* the fissure is large and oblong, and nearer t edge of the shell. To this family belong al the genera *Parmophorus* and EMARGINUL These have no fissure. In *Diadora* the fissure in the margin of the shell. Many species of th family are found fossil.

Fissurellidea.—A genus of shells. See FI SURELLIDÆ.

Fistularia. *Tobacco-Pipe Fish.*—A gen of acanthopterygious fishes forming part of t family *Aulostomidæ*. The species are distin guished by the muzzle being elongated an depressed, and having the appearance of a tub The typical species, *F. tabacaria*, is common i the seas of the West Indies. It lives upon sma fishes and crustacea, which it seeks for und stones, and in the angles and corners of rock drawing them out by means of its prolonge muzzle.

Flacourtia.—A genus of plants. See FL COURTIACEÆ.

Flacourtiaceæ. *The Arnotto family.*— nat. ord. of dicotyledonous plants, consisting shrubs or small trees, with alternate, simpl generally entire and coriaceous leaves. They a for the most part natives of the tropical regio of India and Africa, and are divided into tw sub-orders, *Flacourtieæ* and *Bixeæ*. Many of t species yield edible fruits, which are sweet an wholesome. The genus *Flacourtia* is the ty of the order, and the species are found growin in Madagascar, tropical Asia, and equinocti America. They are spiny shrubs with axillar flowers, solitary or in fascicles. The fruit of *Ramontchi* is eaten at Madagascar, of whic island it is a native, and is sweetly acid. Th young shoots of *F. cataphracta* are considere astringent and stomachic. *Hydnocarpus*, a Indian genus, contains one species, a native Ceylon, which is a tree about thirty feet h height, and bears a fruit which, when eaten, pro duces sickness, giddiness, and a dangerous form of intoxication. The chaulmoogra of Sylhet *Chaulmoogra* (*Gynocardia*) *odorata*, is a tree th seeds of which are employed extensively by th natives of India as a remedy for cutaneous dis

eases, applied externally. *Bixa orellana* supplies the substance known as arnotto. See ARNOTTO.

Flint.—A mineral substance composed chiefly of silica, and found in the shape of nodules in the chalk formation. The true origin of this mineral is still doubtful, though the most probable theory is that these nodules are produced by the deposition around sponges of silica in a state of solution in water. It generally contains abundance of infusorial animalcules. Flints are used for muskets, though their employment in this way is rapidly giving way to the percussion cap. They are extensively used, however, in the manufacture of pottery, and formerly of glass.

Flora.—A term, derived from the goddess of that name who presided over flowers, used to designate the collective vegetation of a country, or district of country, or the enumeration and classification of the plants of some particular country in a book. It is in botany what *Fauna* is in zoology. See FAUNA.

Florideæ. *Red Sea-Weeds.*—A family of acotyledonous plants belonging to the nat. ord. *Algæ*, and synonymous with the *Rhodosporeæ* of some authors. They are generally of a red colour, presenting all the shades from rose to purple-brown or violet, but varying much in external appearance. In some of the genera the species are of a delicate exquisitely feathery structure, in others they are like broad leaves, and in others again they are like little leafless bushes. Those plants which deposit carbonate of lime in their tissues, and are called corallines, belong to this family. See CORALLINA.

Floscularia (*floscŭlus*, a little flower).—A genus of minute animals belonging to the class *Rotatoria*. The species are attached by a contractile and ringed pedicel. They possess two red eyes, which often disappear in the adult, and the rotatory organ is divided into five or six lobes, having elongated, slowly contracting, but not vibratile, cilia radiating from their extremities. They are inhabitants of stagnant waters, living upon aquatic plants, as confervæ, &c., and several species, exquisitely beautiful under the microscope, are described.

Fluocerina.—See FLUORIDES.

Fluoride of Calcium.—Fluor spar, or Derbyshire spar, is a well known mineral, occurring in crystals, regular cubes or octohedrons, which are remarkable for the diversity and vivacity of their colours, as green, yellow, blue, or violet. It occurs also, especially in Derbyshire, in masses, which are of a blue colour chiefly, and are known by the miners as "Blue John." The crystallized forms occur plentifully in Cornwall and the west of England, while the massive is chiefly found in Derbyshire, and the north of England. They are principally found in connection with lead ores. Some of the varieties of this mineral are phosphorescent when acted on by heat. The blue and variegated fluor spar of Derbyshire is turned into various ornamental forms, as candlesticks, &c., and that of Cornwall is used as a flux in the reduction of copper ore. *Fluocerine* is a fluoride (dentofluate) of cerium, a yellow or reddish substance of a crystalline texture, and occurs at Finbo, in Sweden. *Yttrocerite* is a fluoride (fluate) of yttrium, and is found in small crystalline masses disseminated in the pegmatolites of Brodbo and Finbo, in Sweden. *Cryolite*, a white mineral substance found in laminæ, is a soda fluoride of aluminum, and is found at Arksat in Greenland.

Fluorides.—An order of minerals composed of fluoric acid, combined with other elements.

Fluor Spar.—See FLUORIDES.

Flustra.—A genus of polypiform animals belonging to the class *Polyzoa*, and forming the type of the small family *Flustridæ*. The polypidom in the species of this genus is flat, membranous, plant-like, and foliaceous or crustaceous. They are all marine, and many species are described, which are generally found at the bottom of the sea in a few fathoms water. One or two species are said, when quite recent, to exhale a very agreeable odour. *F. membranacea* is a species which forms a gauze-like incrustation on the fronds of sea-weed, and when the animals are protruded shows as a beautiful object under the microscope. Specimens of this flustra have occurred five feet in length and eight in breadth, and as every little cell had been inhabited by a living polype, by counting the cells on a square inch, it was calculated that this web of silvery lace had been the work and the habitation of above two millions of industrious and, no doubt, happy inmates; so that this simple colony on a submarine island was about equal in number to the population of Scotland!

Fluvicolinæ.—A synonym of *Alectrurinæ*. See MUSCICAPIDÆ.

Foeniculum. *Fennel.*—A genus of plants. See ANETHUM.

Foraminifera (*foramen*, a hole; *fero*, to carry).—A class or order of minute animals contained within small calcareous shells which are polythalamous, or divided transversely by partitions or septa into a number of chambers. These animals have at various times been placed in different parts of the animal kingdom. At one time they were considered *Mollusca*, and from the shape and form of their shells were arranged amongst the *Cephalopoda*. At another time they have been placed amongst the *Infusoria*, and formed a section under the name of *Rhizopoda*; and at a third have been referred to the polypes, and placed among the *Polyzoa*. They are now considered a class by themselves, and are characterized by the animals being of a very simple structure, being composed nearly of sarcode, without any distinct separation of organs. They possess, like many of the infusoria, as *Amœba*, &c., a number of filiform processes of considerable length, which are seen issuing from the various external apertures of the shell, and by

which the function of locomotion is performed. The shells are composed principally of carbonate of lime, but the texture varies considerably. In some it is opaque, of a close texture like porcelain, and without any external indication of pores. In others it is porous and perforated, especially in the last segments, with a great many small apertures. In others again it is transparent as glass. The recent species occur in various parts of the surface of the globe in immense numbers. The sand of the sea shore in many places is so completely filled with them, that it appears half composed of these elegant little shells. In the Adriatic Sea, 4,000 or 6,000 have been found in an ounce of sand, and in the West Indies, 3,840,000 have been reckoned in the same quantity. If we calculate larger quantities, as for example, a cubic yard, the amount surpasses all human conception, and we have difficulty in expressing the resulting number in figures. When we regard in this point of view the whole enormous mass of the sea coasts of the earth, we must conclude, that no other series of beings can, in regard to number, be compared with them. The part they play at the present day is wonderful. Banks of sand, which impede navigation, obstruct gulfs and straits, and fill up harbours, are their work, and along with corals they assist in forming those islands which are every day making their appearance in the warm regions of the great ocean. In former eras of the earth's surface the part they played seems still more striking. In the carboniferous

Nummulite in limestone.

period enormous masses of limestone in Russia have been found composed almost entirely of a single species of *Fusolina*, and immense quantities occur in the cretaceous formations in France. They were still more abundant in the tertiary period. The stones of which the largest pyramids of Egypt are built are so full of a species of *Nummulites* that these extraordinary erections appear to be almost entirely composed of them. The stone of which the houses and buildings of Paris are constructed are so full of a species of *Miliola*, that Paris and the villages in the neighbourhood may be said to be built of them. A cubic inch of the stone from the quarries of Gentilly contains upwards of 58,000 of these fossil shells, and the beds of which these quarries are composed are of great thickness and of vast extent. A great many species of foraminifera, both recent and fossil, have been described; but the researches of the latest authors upon this class tend to throw great doubts upon their value, and give reason to believe that though individually the foraminifera are amazingly numerous and abundant, the number of distinct genera and species has been very much exaggerated.

Forficula. *The Earwig.*—See FORFICULIDÆ.

Forficulidæ.—A family of insects belonging, according to some authors, to the order *Orthoptera*, and forming, according to others, the order *Euplexoptera*. The insects belonging to this family have very short elytra, and their wings are folded in such a manner as to be covered by them. Their abdomen is terminated by two hooked appendages, forming a sort of forceps. The species are not very numerous, though individually their number is very great. They live upon vegetable substances, and are of nocturnal habits, seldom showing themselves much during the heat of day. They run swiftly and fly tolerably well. The genus *Forficula* is the type of the family, and the common earwig, *F. auricularia*, a well known species, is the type of the genus. The vulgar opinion, and to which their name in almost all European languages points, that earwigs seek to introduce themselves into the ears of human beings, and cause much injury to that organ, is not founded on fact, for they are perfectly harmless. They are found in damp situations, under stones and the bark of trees, and in flowers, to which they are very hurtful. The females appear to show much anxiety about their eggs, and they have been seen brooding over them with the greatest solicitude. A female earwig has even been seen accompanied by a newly hatched brood of young, which crowded beneath her like chickens under a hen. There are several genera described.

Formica. *The Ants.*—See FORMICIDÆ.

Formicarinæ.—A sub-family of TURDIDÆ.

Formicidæ. *The Ant family.*—A family of insects belonging to the order *Hymenoptera*. Ants have been known and have been the objects of observation from the days of Solomon till the present time. They are social and gregarious,

living in colonies, in nests called ant-hills, the community consisting of males which have always four wings; females, larger than the males and only possessed of wings at the pairing season; and workers, which have never been observed to have wings at any time. After the pairing season the males die. The females lay their eggs in parcels of half a dozen or more, loosely attached. These are taken by the workers and deposited in a safe part of the nest, and carefully tended by them till the young grubs are hatched. These grubs are fed by the workers till they become full grown, when they spin a cocoon for themselves and pass into the pupa state. In this state they resemble in size and appearance barleycorns. They have indeed been often mistaken for them, and hence has arisen the erroneous idea that ants lay up a provision of corn as food for the winter. They are in this pupa state popularly called eggs, and are very much used as food for pheasants. When arrived at the stage for becoming perfect insects, the workers or nurse ants that have had the charge of them all along, cut a passage through the cocoon for the animal to escape. The young females, when they have fairly emerged from their pupa state and obtained their wings, show a great desire to abandon their parent nest and fly away. The males follow, pairing takes place outside the ant-hill, and the fertile females, if not captured by the workers and brought back, commence a new colony in another place. Should they meet with any straggling workers in the neighbourhood where they have alighted, they associate them with themselves, and first stripping themselves of their wings by throwing them off (wings being no longer of any use to them), commence the labour of forming a new city for their future residence. Some ants are furnished with stings—others are without, but these have the power of squirting out an acrid pungent fluid which inflames and irritates the skin like nettles. In general, ants are bolder and more active than any other insects of the same size. A moderate sized individual will attack an animal many times larger than itself. Their nests or hills are variously formed, but all with great skill and dexterity. Some species, such as the sanguinary ant, *Formica sanguinaria*, and the turf ant, *F. cæspitum*, are miners, digging chambers and galleries out of the ground at a depth of from six to nine inches. Others, such as the yellow ant, *F. flava*, are masons, building houses with solid walls to a height of a foot or more, and from six inches to two feet in diameter. A third set are carpenters, cutting their houses out of the wood of trees; such are the emmet or black carpenter ant, *F. fuliginosa*, and the dusky ant, *F. fusca*. In Rio Janeiro the ant-hills are often twelve feet high, and in Guiana and other tropical countries, thousands of nests occur in the trees of every forest. Honey is the chief food of ants, and they are particularly fond of the honey dew excreted by the aphides. They will eat fruit also, and some even devour insects. Ants migrate at particular seasons, but for what purpose is not clear except to obtain better forage. In Guiana, Mr. Waterton says he has met with a colony of a species of small ant marching in order, each having in its mouth a leaf; and the army extended three miles in length, and was six feet broad. They are fond of war. One colony fights against another, and small parties accidentally meeting commence immediately a sanguinary battle. The amazon ants, *Polyergus rufescens*, seem to be a colony of warriors, and they make fierce incursions into the territories of another species of a nearly black colour, the dusky ant, *Formica fusca*, for the purpose of taking slaves to bring up in their own nest. They are generally successful in their attacks upon their enemies, and after driving them from their citadel, they enter it and carry off the larvæ. These are carried home and tended with the utmost care till they are hatched, and are then treated as slaves, and made to do the drudgery of their conquerors. Some kinds of ants are very prejudicial when in great numbers to gardens, and to saccharine substances in houses, such as preserves, &c.; but there are others, as the visiting ant of the West Indies, *Atta cephalotes*, which are useful to man, as they drive away rats and noxious insects from the houses which they visit. Allied to this kind is the driver ant of West Africa, *Anomma arcens*. These ants are exceedingly ferocious. They have no permanent dwelling as other ants have, but range about in vast armies in quest of prey. They make their excursions during the night or in very cloudy weather, the hot rays of the sun being fatal to them. If obliged to march during the day, they construct arches of clay cemented by a fluid excreted from their mouth. Under these arches their pupæ and their prey are carried by the workers. If on their march they are intercepted by a stream of water, they throw across it a bridge of their own bodies, over which the main column marches with freedom and safety. Their community is divided into three classes,—1st, Soldiers to attack and disable their prey; 2d, Assistants to these, to divide the prey into portable portions; and 3d, The labourers or workers. The bite of these insects is very severe, and so intense does it become by accumulation, that the largest animal, if in a state of confinement, is overpowered and destroyed. They have been known to kill the *Python natalensis*, the largest serpent of that part of the world. They are decidedly aggressive in their habits, and so well known are they, that the dread of them rests upon every living thing. Their entrance into dwellings is known by a simultaneous movement of rats, mice, lizards, cockroaches, &c., with which they may be infested. Even man himself, "lord of creation," bows to their power, for let the drivers enter the house at one door, he

quickly makes his escape at the other! They are useful, however, in the economy of nature. They consume much dead animal and vegetable matter which might otherwise taint the atmosphere,—they tend to keep down the rapid increase of noxious insects and vermin, and they compel the inhabitants to observe habits of comparative cleanliness, as a filthy town or house is sure to be visited by them. For an account of the white ants, see TERMITIDÆ.

Forsterite.—A mineral occurring in right rhombic prisms, in brilliant crystals, along with green pyroxene, at Vesuvius. It contains silica and magnesia.

Fossores. *Fossorial Insects.*—A group of insects belonging to the order *Hymenoptera*. The species belonging to this group are solitary in their habits, and most of the species are organized for excavating cells in earth or wood, in which they bury other insects in a wounded and feeble state, and at the same time deposit their eggs; so that when the larvæ are hatched they find a store of food prepared for their subsistence. A few are parasitic, and instead of burrowing, lay their eggs in the nests of other species, at whose expense the young are reared.

Fragaria. *The Strawberry.*—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*, and containing a number of species which are herbaceous, turfy, stoloniferous plants, with alternate leaves, and with white or yellow flowers in form of a corymb at the extremities of the stalks. Strawberries are indigenous to the temperate parts of the western hemisphere, growing also in South and tropical America and the Moluccas. The typical species, *F. vesca*, the common strawberry, is found almost everywhere, and is now cultivated to a great extent for its delicious fruit. An immense number of varieties are produced.

Fragillaria.—A genus of minute algæ belonging to the family *Diatomaceæ*, and till lately considered to be of animal nature, and to belong to the class *Infusoria*. The frustules are linear, symmetrical, united into straight or flat curved filaments; and the valves or carapace lanceolate, oblong, or linear, and not becoming separated into zig-zag chains. Several species are described, all marine.

Francolinus. *The Francolins.*—A genus of partridges. See PERDIX.

Fratercula.—A genus of birds. See ALCIDÆ.

Fraxinus. *The Ash.*—A genus of dicotyledonous plants belonging to the nat. ord. *Oleaceæ*, and forming the type of a sub-order called *Fraxineæ*. This genus contains a good many species, most of them large trees, natives principally of North America, a few growing in Europe and Asia. The greater number of these trees have been introduced into Europe, and several are planted as ornaments to our parks and avenues. The wood is in great request amongst carpenters, wheelwrights, and cabinetmakers. The most common species, *F. excelsior*, the common ash, is amongst our loftiest trees, attaining the height of 70, 90, or 100 feet. Having a straight well proportioned trunk, terminated with an ample cyme, it forms a handsome tree in our parks, and several varieties have been reared, all useful to man. The wood is supple, elastic, white, and capable of taking a good polish. It can be carved and fashioned at will, and made to retain the form it has taken. The bark and leaves are said to be aperient, diuretic, and febrifuge, and furnish a good blue colour to dyers. Amongst the varieties of the ash known to cultivators, one of the most elegant is the weeping ash, *F. pendula*, and it is often engrafted on the common ash to produce a better effect. The flowering ash is now placed in another genus. See ORNUS.

Frazera.—A genus of dicotyledonous plants belonging to the nat. ord. *Gentianaceæ*, consisting of only one species, *F. Carolinensis*, from the root of which is obtained a powerful bitter, as pure as quassia and as useful as gentian.

Fregata. *The Frigate Bird.*—See TACHYPETES.

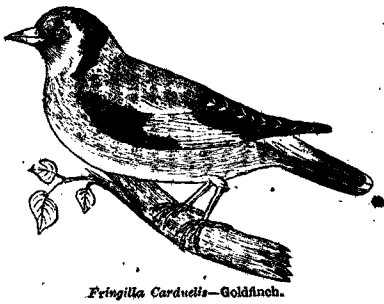
Fregilinæ. } A sub-family and genus of
Fregilus. } birds. See CORVIDÆ.

Fringilla. *The Finch genus.*—See FRINGILLINÆ.

Fringillidæ.—A large family of birds belonging to the conirostral tribe of the order *Passeres*, furnished with a short conical bill, broad at the base, with the commissure not angulated. The species are very numerous, and they have been divided amongst several sub-families, as the weavers, PLOCEINÆ; the hawfinches, COCCOTHRAUSTINÆ; the tanagers, TANAGRINÆ; the finches, FRINGILLINÆ; the buntings, EMBERIZINÆ; the larks, ALAUDINÆ; the bullfinches, PYRRHULINÆ; the crossbeaks, LOXINÆ; and the plant cutters, PHYTOTOMINÆ.

Fringillinæ. *The Finches.*—A sub-family of birds belonging to the family *Fringillidæ*, characterized by having short conical pointed bills, with the culmen straight, and the tip generally entire. Their food consists chiefly of grains, and occasionally insects, and they feed in small flocks. Some of the species have a very pleasing song. The genus *Fringilla*, which gives its name to the family, is also the type of it, and contains some very interesting species. Of these the common chaffinch, *F. cœlebs*, is perhaps the best known and most abundant in Great Britain. It possesses a very sweet note, which is little esteemed in this country, but amongst the peasantry of Thuringia, the admiration of the chaffinch's song becomes a passion. In Belgium, Holland, and some other countries on the continent, it is also much esteemed, and its music is thought to be increased in power and sweetness by searing the poor creature's eyes with a red hot iron. The goldfinch, *Carduelis communis* (*Fringilla carduelis*), is another species which pos-

sesses a sweet song. It has the most brilliant plumage of all our native finches, and is one of the most docile of birds. It is thus a great favourite, and is frequently kept in captivity, where it seems to be as happy as if at large. A looking-glass is often introduced into its cage,



Fringilla Carduelis—Goldfinch.

and from the pleasure which the poor bird takes in looking at itself in the mirror, it has been called the *vainest* of finches. Goldfinches become much attached to their keeper. The greenfinch or green linnet, *Chloris* (*Fringilla*) *chloris*, is a common species in England, and though it has but a poor note of its own, is prized in confinement from its readily acquiring the notes of other birds which it is in the habit of hearing. The brown linnet, *Linaria* (*Fringilla*) *cannabina*, sometimes also called the gray linnet, is common throughout Europe, and has a lively and varied song, which, though not long, is very sweet. It changes its plumage with the seasons, which accounts for its different names. When confined with other birds it easily adopts their song, and, when taken young, it may be readily taught to modulate its voice to any sound it is accustomed to hear. The siskin or aberdavine, *Chrysomitris* (*Fringilla*) *spinus*, a native of Sweden, Norway, and the north of Germany, and a visitor to this country in autumn, remaining with us during the winter, has a very sweet but not loud song, and a mule bird between it and a canary is much prized by bird fanciers. The siskin is a great favourite of the stocking weavers of Saxony, who fancy that its note resembles the sound made by their loom. In some parts of England it is called the barley bird, because it makes its appearance about the time of the barley harvest. The canary bird, *Carduelis canaria*, is a well known bird belonging to this family. This favourite songster is a native of the Canary Islands, from whence it was brought into Europe early in the sixteenth century. In its wild state, in its native groves, the canary is generally of a gray or brown colour, mingled with other colours, but never showing the same brilliancy of plumage as it possesses in its state of captivity. In Germany and the Tyrol the breeding and rearing of canaries gives employment to numbers, and it is chiefly from these countries that the rest of Europe is now supplied. Such are some of the songsters of the finch family. There are others, however, which have no song, amongst which the best known species is our common sparrow, *Passer* (*Fringilla*) *domestica*, a bird which is found in all parts of Europe, and is too familiar to require much notice. Sparrows live chiefly on grain, but they feed their young on the larvæ of insects, and it is said a pair of sparrows will destroy about 4,000 caterpillars weekly for that purpose. In Warwickshire, at the present day, a considerable sum is annually paid by the parishes in one district for killing sparrows, from an idea that they injure the farmer. So much is paid for "sparrow heads." The Java sparrows and Amaduvat finches belonging to the genus *Amadina*, are Indian species of the family, are pretty birds, and are often brought alive as pets to this country. They have no song, and are delicate birds to rear. The wax-bills, belonging to the genus *Estrelda*, are natives of the Indian Archipelago and Australia, and one or two species are often brought over to England alive.

Fritellaria.—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, containing amongst other species *F. meleagris*, the common fritillary of our meadows and pastures.

Fucaceæ. *Sea-Weeds.*—The family in which the plants formerly arranged under the general name of *Fucus* are now placed.

Fuchsia.—A genus of dicotyledonous plants belonging to the nat. ord. *Onagraceæ*, and named after the celebrated botanist Leonard Fuchs. This genus comprises about fifty species, all shrubs, natives of South America, inhabiting principally the Cordilleras of Chili and Peru. They are known by their opposite and whirled leaves, axillary pedúncles, and beautiful pendant flowers, of a red, violet, or rose colour. Many species are now cultivated in this country, and are much sought after as beautiful and ornamental shrubs.

Fuchsite.—A variety of mica, of a green colour, and containing 4 per cent. of oxide of chromium. It is also called biaxial, oblique, or potash mica. It is found in the Zillerthal.

Fucites.—Fossil plants belonging to, or resembling the genus fucus.

Fucus. *The Sea-Weed genus.*—See THALLOGENÆ.

Fulgora. *The Lantern Flies.*—A genus of insects belonging to the order *Homoptera*. See FULGORIDÆ.

Fulgoridæ.—A family of homopterous insects, including amongst others the lantern flies. The genus *Fulgora* is the type of the family. The species are peculiar to South America, and are remarkable for their large and vesicular head. Their colours are various, and they are of considerable size. *Fulgora laternaria*, the common lantern fly, is the typical species, and is said by

some naturalists to be endowed with a luminous property which resides in the head—hence their name. This assertion is contradicted by others, who deny their possession of this property. It is possible that it may be sexual, and may be possessed by the insects at one time of their existence and not at another. Many species of this family emit a white waxy secretion. The immature state of a species of *Flata* produces this secretion, in China, to a remarkable extent, and the production is collected by the Chinese, and employed in the manufacture of the fine white wax so much esteemed in the East Indies. Another species of the family, *Delphax saccharivora*, a native of the West Indies, is extremely injurious to the sugar cane.

Fulgurites.—A term applied to those vitrified tubes found in sand, and believed to be produced by the passage of lightning through it. They have been found in great numbers in Germany, as in the environs of Königsberg in East Prussia, and near Halle in the Saale. They have been found also at Drigg in Cumberland, and vary in external diameter from two and a-half inches to a few lines.

Fulica. *The Coot.*—See RALLIDÆ.

Fuligulinæ. *The Sea Ducks.*—A sub-family of birds belonging to the large family *Anatidæ*, and characterized by their having the hind toe short and furnished with a broad marginal membrane, and the bills short and much elevated at the base. They are principally inhabitants of the ocean or saline lakes, but a few are found on fresh water lakes and rivers in the interior. They obtain their food principally by diving, and this consists of small crabs, shell-fish, and aquatic plants. The species are for the most part northern. The eider duck, *Somateria mollissima*, the canvas-back duck, *Aythia vallisneria*, and the scoters, *Oidemia*, have already been mentioned. See ANATINÆ. A considerable number of other species have been described as inhabiting the northern regions. Such are the golden eye, *Clangula vulgaris*; the spirit duck, *Clangula albeola*; the long-tailed duck, *Harelda glacialis*, &c.—all of which, when young, are of more or less value as food for man.

Fuller's Earth.—A clay so named from the property it possesses, owing to its porosity, of removing stains of grease from cloth, and formerly much used by fullers. It occurs at Nutfield, near Reigate, in Surrey, where it is found in regular beds, and in various other parts of England, in the green sand and oolitic formations. In 1809, a calculation was made that 6,300 tons of fuller's earth were annually used in Great Britain, and of this 4,000 were furnished by the county of Surrey alone.

Fumaria. *The Fumitory.*—A genus of plants. See FUMARIACÆ.

Fumariaceæ.—A family of dicotyledonous plants, of which the genus *Fumaria* is the type. The fumitories are slender stemmed herbaceous plants, growing chiefly in the temperate parts of the northern hemisphere, and containing a watery juice of a bitter taste which exhales a disagreeable smell like smoke. The name is derived from the Latin word "fumus," smoke;—the French call it "fumeterre," from whence our name "fumitory." Several of the species are elegant plants with many deep cut leaves, and flowers in racemes. *F. officinalis*, or common fumitory, grows abundantly in this country, and was at one time used in medicine. See also CORYDALIS.

Funaria.—A genus of acrocarpous mosses, of which there are three species natives of Great Britain. The one best known is *F. hygrometrica*, the much curved elongated fruit stalk of which possesses the peculiar hygroscopic character of twisting in drying, and untwisting again when wetted. On taking a dry fruit stalk in the hand and moistening the lower part with the finger, the capsule will turn itself from the right to the left by taking two, three, or more turns. On moistening the upper part, in the same manner, the capsule turns itself more rapidly in an opposite direction. This moss is found by waysides and under hedges, especially where wood fires have burned, and may thus be generally found wherever gipsies' encampments have been.

Fungi. *The Mushrooms.*—See THALLOGENÆ.

Fungia.—A genus of corals. See ANTHOZOA.

Furcifer.—A genus of deer. See CERVINÆ.

Furia.—A name given to a worm which has been reported by Linnæus and some other naturalists as existing in Sweden and Lapland. It was said to live upon trees, and to dart upon men and animals which passed near it, penetrating the skin, and causing the most severe sufferings. It is now considered a purely imaginary animal.

Furnariinæ.—A sub-family of birds belonging to the tenuirostral tribe, of the order *Passeres*, and family *Certhiidæ*, and having as its type the genus *Furnarius*. The species of this genus are small birds, all living in the warm parts of South America—such as Brazil, Paraguay, Chili, and Guiana—with the exception of one which is a native of the Malouines. Their general colour is red and brown, varied with white and black. They are sedentary birds, are generally seen only in pairs, and there is little difference in plumage between male and female. The note of these birds consists of the repeated cry "tchi, tchi," which they keep up during the whole year. *Furnarius rufus*, a species found on the banks of La Plata, and which is called by the natives "hornero," constructs upon palisades, window sills, &c., a nest of clay in form of an oven. The opening is upon the side, and the interior is divided into two compartments, in the lower of which the female deposits her eggs. The male assists in forming the nest. The annumbi, *F. annumbi*, builds her nest upon trees or cacti, composed of spiny twigs, and open at the top; and

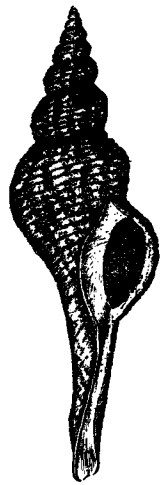
the red annumbi, *F. ruber*, builds one which is pierced with different holes, through which the young can leave the nest and enter it again at pleasure.

Fusisporium.—A genus of hyphomycetous *Fungi*, growing upon vegetable substances, and forming either a kind of mildew, or subsequently an extensive gelatinous stratum upon them. One species, *F. atrovirens*, is a destructive mildew on onions. Numerous other species are described.

Fusolina.—A genus of recent *Foraminifera*. See FORAMINIFERA.

Fustic.—A yellow coloured wood employed in dyeing. There are two kinds—the young, or Zante fustic, and the old fustic. The old fustic is the wood of a species of mulberry, *Morus tinctoria*, a tree attaining the height of sixty feet, and growing in South America, the United States, and the West Indies. It dyes wool and cotton yellow, and is largely imported into this country for that purpose. In 1850, 9,808 tons were imported to Liverpool. The young fustic is the wood of the Venetian sumach, *Rhus Cotinus*, a small shrub growing in Italy and the south of France. The dye imparted by this kind is brighter than the other, and when proper mordants are used, very permanent. Only a small quantity of this fustic is imported.

Fusus. *Spindle Shell.*—A genus of gasteropodous *Mollusca* belonging to the family *Muricidæ*. The shell has generally an elongate, spindle shape, with a spire as long or longer than the terminating canal, which is narrow and straight. The operculum is horny and claw-shaped, with the nucleus terminal. This genus contains many species scattered over most seas, the largest, however, coming from hot climates.



Fusus multicarinatus.

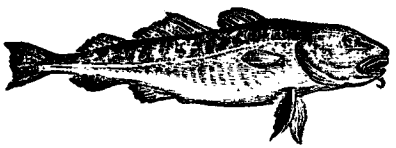
Many fossil species are described. The species here figured is *F. multicarinatus*.

G

Gabbro.—A rock consisting of a mixture of Labradorite and diallage with compact albite. It is a synonyme of euphotide. See EUPHOTIDE.

Gadidæ. *The Cod-fish family.*—A family of fishes belonging to the order *Anacanthini*, a group of fishes detached from the order *Acanthopterygii*, from the species having their fins separated by *flexible jointed rays*, instead of *unjointed* or *inflexible spines*. The family *Gadidæ* is characterized by having the slender and pointed ventral fins situated under the throat more anteriorly than the pectorals, and the dorsal fins being two or three in number. The body is lance shaped, moderately elongated, and covered with small soft scales. It is attenuated and compressed at the tail, but the abdomen not being large, and the muscles of the back being very thick at their origin, there results from this form an abundance of muscular flesh, which being light and well tasted, renders them valuable as an article of food. The fins are destitute of spines, and the head is without scales, is always of a large size, and the wide throat is armed with several rows of unequal pointed teeth. The swimming bladder is generally very large and strong. The species are very reproductive, the number of their eggs being counted by hundreds of thousands. Leuwenhoeck counted 9,384,000 eggs in a cod-fish of a middling size. The family is one of much importance to man, and the fisheries established for the capture of its various members, have, more than any other tribe of fishes, been the means of forming great numbers of hardy and able seamen. Their head-quarters are in the northern seas and those of cold and temperate climes. They are scarcely known near the equator, but reappear in the high southern latitudes, in the same generic forms, though differing in species. They are found on the Australian and New Zealand coasts, and, as has been well observed, doubtless fisheries of these useful fishes will hereafter be established there, when the submarine sandbanks come to be known, and the increase of population creates a greater demand for fish as articles of food. The family is divided into several genera according to the number of their fins, and contains the true cod, *Morrhua*; the coal-fish, *Merlangus*; stock-fish, *Merlucius*; ling, *Lota*; and torsk, *Brosmius*. The common cod, *Morrhua callarias*, is one of the most important species of the family. It resides in immense shoals in the northern seas, their grand rendezvous being the banks of New-

foundland, and is found in great abundance on our own coasts. The catching and curing this fish, and the partial consumption and sale, supplies employment, food, and profit, in this country, to thousands. Their general weight is from fourteen to forty lbs., but individuals have been taken weighing seventy-eight lbs., and



Morrhua callarias (*Gadus morrhua*)—Cod-fish.

measuring five feet eight inches in length. The haddock, *Morrhua æglefinus*, is nearly allied to the cod, though considerably smaller, and as its flesh is sweet and wholesome, and can be preserved with facility, it is a fish of considerable value. The haddock is generally twelve or fourteen inches in length, and weighs from two to three lbs., though individuals occasionally occur nearly three feet long, and weighing ten or twelve lbs. On each side of the body, on the shoulder, is a large black spot, which popular superstition asserts to be caused by St. Peter's finger and thumb when he took the tribute money out of its mouth. Unfortunately for the truth of this vulgar fable, the haddock does not exist in the Sea of Galilee, which is a fresh water lake. The coal-fish, *Merlangus carbonarius*, is a much less valuable fish than either of those already mentioned. It is a native of the Baltic, the Northern, and the Mediterranean Seas, and is also abundant on the northern coasts of this country. It is a coarse fish, and derives its name from the dusky pigment which tinges the skin, and which, when handled, soils the fingers like moist coal. When full grown, the coal fish is about two and a-half feet long, and weighs thirty lbs. When very young, about three to five inches in length, they are considered very delicate, but when about a year old, and especially after spawning, the flesh is so lank as to be almost worthless. The whiting, *Merlangus vulgaris*, a smaller species than the last, seldom exceeding a pound and a-half in weight, is a much more valuable fish than the coal-fish, and forms a delicate and light article of food. It abounds on all the British coasts, and comes in large shoals towards the shore in the months of January and February, for the purpose of depositing its spawn. The hake or stock-fish, *Merlucius vulgaris*, a native of the north of Europe and the Mediterranean, and common on our own shores, forms a very useful article of food for the lower orders in many parts, both in this and other countries, though seldom seen at the tables of the richer classes. It is generally from one to two feet in length, and is a very voracious fish, devouring great quantities of pilchards. The ling, *Lota molva*, is a well known and valuable species of this family. It is an inhabitant of the northern seas, and forms in many places a considerable article of commerce. Large quantities are taken among the Western Islands, in the Orkneys, on the Yorkshire and Cornish coasts, and, generally speaking, all round the Irish coasts. The ling is usually from three to four feet long, and when in season, the liver, which is white, abounds with a fine flavoured oil. Besides what are used as food, fresh, large quantities are cured for exportation. In 1854 it was calculated that the take, in Scotland, of cod and ling, amounted to 3,523,269 individuals, of which 1,385,699 were from the Shetland Islands. 109,684 cwt. were cured dried, and 6,166 barrels were cured in pickle; whilst 58,042 cwt. were disposed of fresh, making a total of 167,726 cwt. cured or fresh; of which large quantity 19,557 cwt. were exported. The torsk, *Brosmius brosme*, is a fine species, closely allied to the cod, and found abundantly in the Shetland Islands, where it is much prized. The best cod liver oil is procured from the liver of this fish. The cod fishery on the banks of Newfoundland used to be of much greater importance to Great Britain than it is at the present day. At an average of the three years ending with 1789, we were said to have had 402 ships, 1,911 boats, and 16,856 men employed in that fishery alone. During the last great war, when the French were excluded from this fishery, the English fishing was unusually productive, the total value of the produce of the Newfoundland fishery in 1814 being upwards of £2,800,000. Since the peace the British fishery has much declined; and in 1851 the total sum produced by this fishery, including salmon and seals, &c., amounted only to £920,117. The fishery of cod, and trade in dried fish in general, seems on the decline of late years, and this is stated to arise from the relaxed observance of Lent in Spain, the Netherlands, and other Roman Catholic countries. The French have a considerable trade with Newfoundland, but the American fishery is now by far the most extensive of all. In 1852, no less than 102,659 tons of American shipping were employed in this branch of trade, and the aggregate value of fish exported, in this same year, amounted to 453,610 dollars.

Gadolinite.—A mineral of a greenish or velvet-black colour, found massive or in oblique rhombic prisms. It is sometimes mixed with platinum, and contains a considerable quantity of yttrium in its composition.

Gahnite or **Automolite.**—A mineral occurring at Fahlun in Sweden imbedded in talc slate. It is a variety of spinel, *Zinc-spinel*, and consists of silica, alumina, and oxide of zinc.

Galactodendron. *The Cow Tree.*—A genus of plants. See ARTOCARPACEÆ.

Galago.—A genus of lemurs. See LEMURIDÆ.

Galanga or Galangal.—A root like that of ginger, of an agreeable aromatic smell, and a hot spicy taste like a mixture of pepper and ginger, with some bitterness, the produce of *Alpinia Galanga*, a plant which is a native of India. A similar product is obtained from several other species of *Alpinia*.

Galanthus.—A genus of monocotyledonous plants belonging to the nat. order *Amaryllidaceæ*, and containing only two species, which are natives of Central and Southern Europe, and Asia Minor. The best known and most common species is the snowdrop, *G. nivalis*, which obtains its name from its early flowering, its pretty, white, delicate, and drooping flowers often showing themselves whilst the snow is still on the ground. The bulbous root possesses a bitter taste.

Galathea.—A genus of bivalve *Mollusca*, belonging to the family *Tellinidæ*. The species upon which the genus is founded, *G. reclusa*, is a native of the fresh waters of Western Africa. The shell, unlike most fresh water shells, is very solid and thick, and its surface is covered with a fine green epidermis.

Galathea.—A genus of *Crustacea* belonging to the order *Macroura*, and forming the type of the family *Galatheidæ*. The carapace of these crustaceans is generally covered with transverse furrows, fringed with small brush like hairs. Four species are known, three of which are natives of the Mediterranean and our own shores; the fourth inhabits the shores of Chili.

Galaxidæ.—A family of acanthopterygious fishes, nearly related to the *Salmonidæ*, and formerly constituting a part of that family. They have no adipose fins, and are destitute of scales. The teeth are of moderate size. The genus *Galaxias* is the only one, and it contains about seven species. They are all natives of fresh water, and resemble very much in appearance our common trout. In Australia and New Zealand, they are commonly known to the settlers by the name of trout, and appear to represent in the southern hemisphere the trouts of Europe. As an article of food, they are softer and more oily than our northern species of the salmon family. Some species are also found in the Falkland Islands and in Patagonia.

Galbanum.—A gum resin imported to this country from the Levant and Persia, the produce of an umbelliferous plant, still undetermined.

Galena. *Sulphide of Lead.*—An ore of lead. See LEAD.

Galeodes.—A genus of spiders belonging to the family *Solpugidæ*. The species of this genus are amongst the most remarkable of the class to which they belong. *G. vorax*, a native of Bengal, is described as very voracious, attacking during the night other insects, and even lizards, and gorging themselves till they can scarcely move. A lizard three inches long, exclusive of the tail, has been killed by one of these spiders, and completely devoured, except the jaws and skin, in a wonderfully short time. A species is found in the south of Spain, *G. intrepida*, which runs with great quickness, and is so bold, that when attempted to be laid hold of, it stops, and most courageously shows fight. About twenty-seven species have been described.

Galeopithecus. (*γαλη*, a cat; *πιθηξ*, a monkey). *The Colugos* or *Flying Lemurs.*—A genus of animals belonging to the class *Mammalia*, order *Primates*, and forming the type of the family *Galeopithecidæ*. They are distinguished from all the other families of the order to which they belong, by having the hairy skin of the body extended between the body and limbs, so as to form a kind of parachute. Though the possession of this wing-like expansion connects them with the bats, it does not enable the animal to fly like them, but permits them to take long sweeping leaps from tree to tree. They are nocturnal animals, living on fruits and insects, and suspending themselves by their feet to the branches of trees, with the back downwards, and thus enabling them to form a kind of hammock in which they nurse their young. Two or three species have been recorded, natives of the islands of the Indian Archipelago.

Galeopithecus rufus.

Galerida.—A genus of larks. See ALAUDINA.

Galerita.—A genus of insects belonging to the order *Coleoptera*, and family *Carabidæ*, containing about eighteen species, all of which are natives of South America, with the exception of two, which inhabit West Africa.

Galerites.—A genus of fossil radiate animals belonging to the *Echinodermata*, and family *Galeritidæ*. The species are elevated, of a conical shape, or oval, and are found chiefly in the chalk.

Galeritidæ.—A family of echinodermatous animals with the mouth near the centre of the under side, and in the recent species having the shell covered with very small spines. The lines of pores extend from the middle of the back to the mouth. They are sometimes interrupted at the margin, but are seen again forming five dis-

tinct petal-like impressions on the under side near the edge of the mouth. Only a few species are found in a recent state, the great proportion being fossil. See GALERITES.

Galeruca.—See GALERUCIDÆ.

Galerucidæ.—A family of leaf-eating beetles, containing several species destructive to the leaves of plants upon which they feed. They are generally of small size, and obscure colours. The larvæ feed either upon or in the interior of leaves, devouring the parenchyma, and undergoing their transformations in that situation. In certain seasons, when they are numerous, whole trees are denuded of their foliage by some species, and cruciferous plants are the favourite food of others. The turnip fly, *Haltica nemorum*, is a well known species from the ravages the perfect insect commits upon the turnip. In Devonshire, it is stated the loss in one instance alone was estimated at £100,000 sterling. In the spring of 1837 the vines in the neighbourhood of Montpellier were attacked to so great an extent by another species, *Haltica oleracea*, in the perfect state, that fears were entertained for the plants, and religious processions were instituted for the purpose of exorcising the insects. *Galeruca vittata*, the striped cucumber beetle, a North American species, attacks the leaves of cucumbers, pumpkins, and melons, occasionally doing great damage to the plants.

Gallictis.—A synonym of the grison. See GULO.

Galidium.—A genus of cryptogamic plants. See THALLOGENÆ.

Galipea.—A genus of dicotyledonous plants belonging to the nat. ord. *Rutaceæ*. They inhabit the warmer parts of South America, and from one or more species is procured the angostura bark of commerce. *G. officinalis*, a native of the higher lands of the missions of Carowy, in Columbian Guiana, is now considered to be the species from which the best is obtained. Angostura bark is a valuable tonic and febrifuge, and is a good deal used in medicine.

Galium.—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ*, sub-order *Galieæ*, and by some botanists referred to a distinct nat. ord. *Galiaceæ*. The species are numerous (about 180 having been described), and are herbaceous, with square stems and verticillate leaves. They are found chiefly in northern and temperate regions, and the roots of many yield a rich red dye, superior to that of madder, though they are too small to render their culture valuable. One of the most common species is *G. verum*, ladies' bed-straw or cheese rennet, which is a native of various parts of Europe and Siberia, and very common in Great Britain. The odour of the flowers is sweet, the stalks and flowers have been used in Cheshire to curdle milk, and it is said to give the peculiar flavour to that kind of cheese. *G. Aparine*, common goose-grass, or cleavers, is well known to pedestrians from its adhering to their clothes by means of the asperities which cover the stems and leaves. It was called by the Greeks *Philanthropos*, or lover of man, and from its growing in hedges, which it climbs up to the length of twenty feet, it is called by our country people "Robin run-the-hedge." They also consider it to be a purifier of the blood, and an antiscorbutic, and the seeds are occasionally used as a substitute for coffee. The root contains so much of the red dye, that birds which feed upon them, have their bones tinged with the colour.

Galleria.—A genus of nocturnal lepidopterous insects belonging to the family *Tineidæ*. The species of this genus inhabit the nests of bees, and the larvæ are well known from the mischief they occasion to the contents of the hive. They feed upon the wax of the comb and in order to protect themselves from the stings of the angry insects upon whom they have intruded, they construct tubes formed of wax, and lined with silk, in which they reside and undergo their changes. They occasionally appear in such great numbers as to destroy the hive, enveloping the comb and many of the bees in the webs spun by the larvæ. They appear to have been known to the ancients, and are mentioned by Aristotle and Virgil as the great pests of bees hives.

Gallinæ.—An extensive order of birds characterized by their having a bill shorter than the head, the upper mandible arched, covering the lower, and having at its base a membrane in which the nostrils are pierced, and which are covered by a cartilaginous scale. They have generally short wings, and a heavy flight. The order contains several large families, comprising many birds of great importance to man, such as the PHASIANIDÆ, consisting of the peacocks pheasants, domestic poultry, and turkeys; the TETRAONIDÆ, containing the partridges, quails blackcock, grouse, &c.; the CRACIDÆ or curassows; MEGAPODIDÆ or mound birds, &c., &c. The gallinaceous birds live upon grain, berries herbs, worms, and insects. They reside chiefly on the ground, and construct their nests there but perch upon trees, &c., when they go to sleep. Many are fine large birds, and are often distinguished by a very brilliant plumage.

Gallinula. *The Moor Hen.*—See RALLIDÆ

Gallinulinæ.—A sub-family of birds belonging to the order *Grallæ*, and family *Rallidæ* and containing the moor hen, *Gallinula*, the coot, *Fulica*, &c. See RALLIDÆ.

Gamasidæ. } A family and genus of mites.
Gamasus. } See ACARIDÆ.

Gambogia.—The genus of plants yielding gamboge. See CLUSIACEÆ.

Gammarus.—A genus of crustaceans. See AMPHIPODA.

Ganitrus.—A genus of plants. See ELÆOCARPEÆ.

Ganoidei.—An order of fishes. There are four kinds of scales in fishes—*Cycloid*, *Ctenoid*, *Placoid*, and *Ganoid*—and the variations of structure of these has been made the basis of an arrangement of fishes into four different orders. The difference between cycloid and ctenoid scales is very slight, and its systematic application is consequently confined to very narrow limits; but this is not the case with regard to ganoid scales. These are bony, generally of a rhombic form or quadrangular, seldom rounded in outline or imbricated in position, and their surface is always smooth and coated with a layer of enamel; they are generally arranged in oblique rows, those in each row being usually united to one another by a hinge-like prolongation of the anterior angle. This structure of scales has been partially made use of for the arrangement of a number of fishes into one group, which do not properly belong to any of the other orders. Other characters, however, are added; and the order *Ganoidei* may be characterized as one, containing fishes provided with either tubular and angular, or round enamelled scales, or with bony plates, or a perfectly naked skin. The living ganoids have completely bony skeletons; but in the fossil ones many have had skeletons soft and cartilaginous, like those of the sturgeon. The fins usually have the first ray in form of a strong spine. But the most essential characters are derived from the trunk of the arteries being provided with numerous valves, their gills and opercula being free, and their ventral fins being placed on the abdomen. This order contains the families *Lepidosteidæ* and *Polypteridæ*,—see LEPIDOSTEUS; *Amiidæ* and STURIONIDÆ. A single genus of American fishes, *Amia*, containing about ten species, differs in many respects from all other fishes arranged under these three families, and has by Sir J. Richardson been constituted the type of a separate family, *Amiidæ*. The mouth of these fishes is that of a trout, with the exception of teeth on the tongue; and in many other respects they are closely allied to the malacopterygians. Their arterial trunk, however, has been found to possess two rows of valves, and a spiral valve of several turns in the intestine. The species are fresh water fishes; and at New Orleans they are known by the name of mud-fish. They exist in almost all parts of the United States, but are chiefly abundant in the muddy streams and lakes of Georgia and Florida.

Garcinia.—A genus of dicotyledonous plants belonging to the nat. ord. *Guttiferæ* or *Clusiaceæ*, and named after Dr. Garcin. The principal species is that from which the mangosteen is obtained, *G. Mangostana*. The tree which produces this fruit, when at its full growth, rises to the height of about twenty feet, having a straight tapering stem, with numerous horizontal branches, bearing large, oval, shining leaves, seven or eight inches long. The tree is of a formal growth, and the flower resembles a single rose in form and colour. The fruit is of the size of a small orange, of a chocolate-red colour, and having an external shell, like that of a pomegranate. This is filled with a soft, juicy pulp, in the form of six pure white pips, of a most delicious flavour. We cannot compare the taste of the mangosteen with any

Garcinia Mangostana—The Mangosteen.

other fruit; it is perfectly *sui-generis*, and is perhaps the most delicious fruit in the world. It is as wholesome as delicious, and is a fruit which is allowed to be eaten unsparingly by sick persons and invalids. This plant is difficult to rear except within a few degrees of the equator. It grows abundantly at Malacca and Singapore, and in the islands of the Indian Archipelago, though originally a native, it is said, of the Moluccas. Specimens have occasionally been sent to England. In 1833 one was sent from the Calcutta Botanic Gardens to Sion House, and after twenty-two years' unremitting attention, it produced fruit in 1855. The fruit ripened, and was pronounced by connoisseurs to be equal to that of tropical growth.

Gardenia.—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ*, sub-order *Cinchoneæ*, and named after Dr. Garden. This genus consists of trees, or shrubs, bearing white and fragrant flowers, of which several are cultivated on this account, and are known by the name of Cape jasmines. About fifty species are known, natives of the East and West Indies, South America, Madagascar, and the Cape of Good Hope.

Garnet.—A well known precious stone, much used for ornament, and found in mica slate and primary rocks. The essential ingredients of garnet are silica, alumina, and oxide of iron. There are many varieties. The precious garnet, or almandine, contains in addition to the ingredients

mentioned above, a little oxide of manganese and carbonate of lime. The best are from Ceylon and Greenland. The Bohemian, or red garnet, pyrope, or carbuncle of the ancients, is of a blood-red colour, and is found in the mountains of Bohemia, and in the East. They make a rich gem, and are cut thin on account of their deep colour. The green garnet, or grossularite, is of an asparagus-green colour, translucent with a resinous lustre, and is found in Siberia, near the Wilni river. Several other varieties are enumerated, and they are found in the mountainous parts of most countries. When powdered, garnet is used for the same purpose as emery.

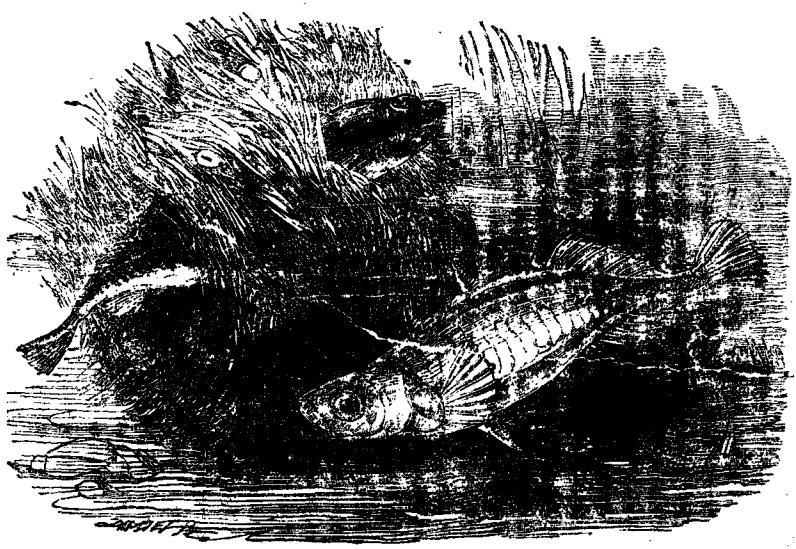
Garrulinæ. Garrulus. { A sub-family and genus of birds belonging to the family CORVIDÆ.

Gasteromycetes. — A section of acotyledonous plants belonging to the nat. ord. *Fungi*, and containing many species, varying in size from microscopic minuteness, to the dimensions of large leather balls. Some of the microscopic species are in the form of mildew, forming on the leaves of the rose trees, and other plants. In the larger kinds, when ripe, the internal structure is found to be gone, except the spores, and detached parts of the filaments on which they were developed, and these escape on the bursting of the now bag-like peridium, as a fine powder. Such is the case with the genus *Lycoperdon*. In the species of *Phallus*, the mushroom is in form of a columnar stalk, with an oval or rounded head. Some other species resemble truffles in their mode of growth, being globular, or depressed balls, growing underground.

Gasteropoda (γαστηρ, belly; πους, a foot). —A class of animals belonging to the sub-kingdom *Mollusca*, characterized by their creeping upon a fleshy disc, or *foot*, placed under the belly. This class comprises all the univalve shells, and many others which have no shells, and are in consequence called naked mollusca, as the *Doridæ*, &c.

Gasteropteron (γαστηρ, belly; πτερον, wing).—A genus of molluscous animals belonging to the class *Gasteropoda*, and family *Bullidæ*. It contains only one species, which is a small shell-less animal, of a beautiful red colour, edged with blue, and adorned with a number of small white spots. The sides of its head are dilated into large wings, by means of which it swims with considerable rapidity, turning on its back. It occurs in the seas of Sicily.

Gasterosteus. *The Sticklebacks.*—A genus of acanthopterygious fishes belonging to the family *Scomberidæ*, and characterized by the



Gasterosteus aculeatus—The Stickleback, male and female in her nest.

...ies of the pelvis being united to the enlarged bones of the humerus, forming a kind of bony corselet, by the ventral fins being placed behind the pectorals, and reduced to a single spine, and by the rays of the first dorsal fin being separate and isolated spines. The species of stickleback are all natives of fresh water, with one or two exceptions; they are very active, pugnacious, and voracious, and live upon aquatic insects and worms. The three-spined stickleback, *G. acu-*

leatus, is the best known and most common species, being abundant in the brooks, rivers, and ponds of most parts of Great Britain, and varies from two to three inches in length. The fifteen-spined stickleback, *G. Spinachia (Spinachia vulgaris)*, is the marine species, and is common on all our coasts, and in the Baltic. It is remarkable for its habit of constructing a nest formed of sea-weed, confervæ, &c., bound together by a long thread of an albuminous secretion, in which it deposits its spawn. The female guards this nest with great care for several weeks, and never leaves it till the young fry are hatched.

Gastrobranchus.—A genus of malacopterygious fishes belonging to the family *Petromyzidæ*, or lampreys. There are only two species known, one of which, the hag, *G. glutinosus*, is an inhabitant of the northern seas, and is from four to six inches long. It is remarkable for its want of eyes, and its teeth are confined to the tongue. It is of an extraordinary glutinous nature, and when placed in a tub of water, emits such a quantity of mucus from the pores of its lateral lines, as to convert the water into a jelly. It is said to enter into the bodies of such fishes as it happens to find on the fishermen's hooks, and which consequently have not the power of escaping its attack. Gnawing its way through the skin, it devours all the internal parts, leaving only the bones and skin remaining.

Gastrochænidæ (*γαστηρ*, belly; *χαινω*, to gape).—A family of bivalve shells, the animals of which live enclosed, or sometimes imbedded, in the substance of a shelly tube. This tube is formed by the animal to protect its elongated and partly naked body from the roughness of the sand, or the rock, in the holes of which it resides. The family contains a good many different genera, as ASPERGILLUM, CLAVAGELLA, &c., and takes its name from the genus *Gastrochæna*, the animals of which inhabit a thin equivalve, gaping shell, the valves united by a ligament, which is narrow and external. They perforate shells and limestone, the external orifice of the perforation being shaped like an hourglass. When burrowing in shells, the animal often passes quite through into the ground below, and then completes its abode by cementing such loose material as it finds, into a flask-shaped case, having its neck fixed in the shell. The species are natives of various parts of the world, as many as ten having been described.

Gastrophilus.—The bot-fly of the horse. See ŒSTRIDÆ.

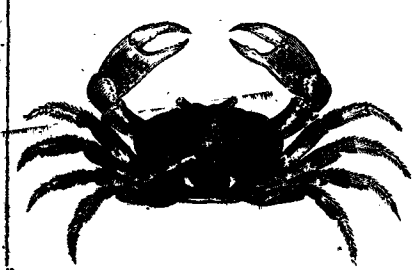
Gaultheria.—A genus of dicotyledonous plants belonging to the family *Ericaceæ*, and containing several ornamental species. They are shrubs, and two species, natives of North America, yield a berry which is edible, and very agreeable to the taste. That of *G. procumbens*, the partridge berry, or mountain tea, contains an aromatic, sweet, highly pungent, volatile oil, which is antispasmodic and diuretic. It is used in North America as tea, and brandy, with the fruit steeped in it, is taken as a bitter. The oil is known as oil of wintergreen, and is used by druggists to flavour syrups, and also by perfumers.

Gavialis. *The Gavial.*—A genus of crocodiles. See CROCODILIDÆ.

Gazella. *The Gazelle.*—A genus of antelopes. See ANTILOPEÆ.

Gebia.—A genus of crustacea. See MACROURA.

Gecarcinus (*γη*, the earth; *carcinus*, crab). *The Land Crab.*—A genus of *Crustacea* belonging to the order *Decapoda*, section *Brachyura*, and family *Catometopa*. The carapace in this genus is transversely oval, and very tumid and convex on the upper surface. The respiratory cavity is very large, and the membrane which lines it is very spongy, and forms, with a fold on the inferior edge, a kind of gutter, fitted for containing water when the animal is on land, and exposed to the air. The species of this genus are very remarkable. Instead of living in water like almost all other crustacea, they inhabit the dry land, and only come to the sea in spawning time. Some of them even die when submerged for any length of time. They are known by the name of *land crabs*, and are all natives of hot climates. Some live in woods, and burrow in the ground. Others inhabit marshes, and a third set are found on wooded hills. A species found formerly in great abundance in the highlands of Jamaica, *G. ruricola*, the black, or mountain crab, has



Gecarcinus ruricola—The Land Crab.

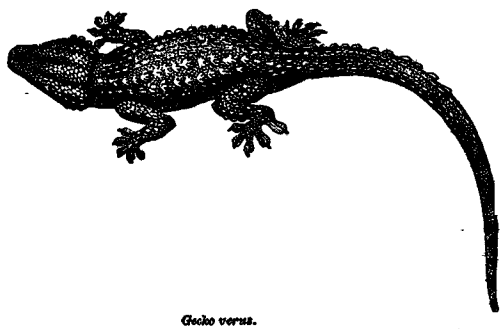
been described by several travellers. When the season for spawning arrives, they leave the hills in regular armies, and travel in a straight direction for the sea. Nothing stops them in their course. If they meet with a large rock, or a house, instead of turning aside to avoid the obstacle, they march right over it in a straight line. After depositing their eggs in the sand of the sea shore, they commence their journey home, pursuing the same undeviating course. On their sea-ward journey they are in fine condition, and are much sought after for the table. Immense numbers are taken for this purpose, and their flesh, which is pure white, is highly esteemed. Some other species, which live in the neighbour-

hood of sugar cane plantations, do much injury to the planter, as they are very fond of the cane, and suck its juice. They are very nimble, and have such dexterity in darting in any direction, or with any part of their body foremost, that they are caught with great difficulty.

Gecinus. — A genus of woodpeckers. See PICIDÆ.

Gecko. — A genus of reptiles. See GECKOTIDÆ.

Geckotidæ. *The Gecko family.* —A family of reptiles belonging to the order *Saura*, and section *Pachyglossæ*. There are upwards of ninety species known, which are small nocturnal animals, natives of warm climates, inhabiting both Old and New Worlds, and Australia. Their short legs are terminated by toes, more or less dilated, flattened underneath, and admirably constructed for enabling them to lay hold on objects upon which they walk, to run with ease on the smoothest surfaces, or remain stationary on them, with their back downwards like a fly. By some biblical commentators, "the spider that taketh hold with her hands, and is in kings' palaces," is believed to have been a gecko. Many of the species are fond of introducing themselves into human habitations, and as they are by no means agreeable in their aspect, having a dull lurid appearance, with depressed heads, and large round eyes, they are looked upon by people with a certain amount of horror and prejudice. They are in reality timid inoffensive creatures, which can injure people neither by their teeth nor their claws, though the latter being hooked, sharp, and retractile, may scratch the skin of any person they may walk over. Their food consists of insects which they catch at night. Some live in houses, dwelling in holes in the walls, or under stones, such as the *Hemidactylus*, or house lizards as they are called. Others on trees, leaping after insects from branch to branch, and some of these, as *Pteropleura*, have the skin on the side of the chin, body, limbs, and tail, expanded into a kind of fin, which the animal uses as a parachute to assist itself in jumping. The name, gecko, is derived from the peculiar cry they utter. The numerous species are grouped into many genera, and these are arranged into sections, according to the structure of their toes. In one section the toes are dilated, with *two* rows of membranous plates beneath, under the dilated part. In a certain number of these, the last joint of the toes is short, inflexed, and sheathed in the notch between the front of the two series of plates, such as *Thecadactylus*, in which the toes are half webbed; and in others the last joint of the toes is slender, compressed, elongated, produced, clawed, and free from the dilated penultimate joints, such as *Hemidactylus*. In another section the toes, more or less dilated, have *a single* series of transverse plates beneath. In a number of



Gecko verus.

these the last joint only of the dilated toes is compressed, and rather produced, or wanting, the plates beneath the toes being membranous and smooth, such as *Platydactylus* and *Gecko*. While in another set the toes and thumbs are clawed, slightly dilated below at the base, the two or three last joints compressed, angularly bent, and the membranous plates beneath the toes transverse and smooth, such as *Eublepharis*, *Cyrtodactylus*, &c.

Gelasimus.—A genus of crustaceans. See CRUSTACEA.

Gelatine.—One of the principal productions of the animal kingdom, composed of carbon, hydrogen, nitrogen, and oxygen. It is found present in all parts of the body, and constitutes the walls or external investment of the cells of which animals are composed. The best gelatine is procured from hides or skins of animals, boiling them in a sufficient quantity of water to form, when it cools, a jelly. It is also manufactured from the hoofs and ears of horses, oxen, calves, and sheep; and may also be procured from bones, muscles, tendons, and ligaments, &c. Pure gelatine is obtained from the intestines of fishes, and especially from the swimming bladder of the sturgeon, and is called isinglass. It is colourless, transparent, inodorous, and insipid to the taste. Gelatine is extensively used in the industrial arts. In the form of glue or colla it is very much employed in carpentry, upholstery, and papermaking, &c., from its adhesive qualities. Combined with tannin, it forms the basis of leather. When purified, it can be formed into plates of almost glass-like transparency; and when coloured, is employed for making artificial flowers and many other ornamental objects. Experiments have been made to ascertain if gelatine is nutritious; but it is now found that it is not adapted for food.

Genetta. *The Genet.*—See VIVERRIDÆ.

Genista.—A genus of dicotyledonous plants belonging to the papilionaceous tribe of the nat.

ord. *Leguminosæ*, and containing upwards of eighty species, generally small shrubs, with or without spines, and natives for the most part of southern and central Europe. The species have yellow flowers, and most of them yield a yellow dye. The *Planta Genista*, or *Gen* of the Celts, the *Gênet* of the French, was the badge of a long race of English kings; hence called Plantagenets. A few are natives of Britain, amongst which *G. tinctoria*, dyer's weed or woad, is perhaps the most common. The flowers are used for dyeing wool. When cows are allowed to feed on it, their milk becomes bitter and disagreeable; and the unpleasant taste which cheese and butter frequently have, is often attributed to this cause. The seeds are said to act as a mild purgative, and their ashes have been employed as a diuretic. *G. (Spartium) monosperma*, is a native of Spain, on the shores of which country it is found to be very useful in binding the otherwise drifting sand, and, by its beautiful fragrant blossoms, converting a barren waste into a lovely garden. Goats are fond of the leaves and young branches.

Gentiana. *The Gentian.*—A genus of plants. See GENTIANEÆ.

Gentianaceæ. *Gentian family.*—A nat. ord. of dicotyledonous plants, consisting of a great many species, spread over all regions of the globe, and growing from the line of perpetual snow on the high mountains to the hottest regions under the equator. They are chiefly herbs, seldom shrubs, generally glabrous, and possess a juice which is very bitter. This extensive family, including sixty genera, and upwards of four hundred and fifty species, is divided into two large sub-orders, GENTIANEÆ and MENYANTHEÆ.

Gentianeæ.—A sub-order of plants of the family *Gentianaceæ*, the type of which is the genus *Gentiana*. This genus contains a considerable number of species, several of which are very ornamental, possessing beautiful flowers of blue, purple, red, yellow, and white, though destitute of perfume. The roots of most of them possess a bitter principle, called *Gentianine*, the presence of which renders them tonic and febrifuge. *Gentiana lutea*, the common gentian, a native of the Pyrenees and the Alps of Switzerland and Austria, growing usually at an elevation of from 3,000 to 5,000 feet, is the chief source of the root used in medicine. Besides the bitter principle, the root contains a good deal of mucilage and sugar, in consequence of which the Swiss and Tyrolese prepare from it a liqueur held in high esteem among the people. Several species are natives of Britain, and many others are cultivated in our gardens for their beauty and brilliant colours. Most of the species are alpine, inhabiting the temperate parts of Europe, Asia, and America. The CHIRAYTA, which furnishes a very pure bitter, is another genus of this sub-order; as is also ERYTHRÆA or CHIRONIA.

Genus.—A genus has been defined to be, a re-union of races called species, brought together by a consideration of their relations, and constituting so many small series, limited by characters which are chosen arbitrarily, in order to circumscribe them. Unfortunately at present there are no generally recognized rules for the construction of genera amongst plants and animals; and as almost every naturalist has his own particular views with regard to the propriety of uniting or separating particular groups of species, the synonyma of genera become every day more difficult to ascertain.

Geode.—A name given to cavities in rocks, the internal parieties of which are covered with stalactites or crystals of some other mineral substance. These crystals are generally of great purity.

Geodephaga (*γι*, earth; *δαφαγω*, to devour). *Predaceous Land Beetles.*—A division of coleopterous insects, which are chiefly found beneath stones, under clods of earth, &c. It is one of the most extensive groups of insects, about 2,500 species having been enumerated. It contains the two large families CICINDELIDÆ or tiger beetles, and CARABIDÆ or ground beetles.

Geoffroya.—A genus of dicotyledonous plants belonging to the papilionaceous tribe of the nat. ord. *Leguminosæ*. The species are trees, natives of the West Indies and South America. The bark of *G. inermis* (*Andira inermis* of some botanists), the cabbage tree of the West Indies, with showy flowers, of a reddish-lilac colour, and a fruit the size of a plum, when properly exhibited, acts as a powerful anthelmintic. In small doses it is purgative; but in large ones it is poisonous, producing violent vomiting, with fever and delirium. The fruit of *G. superba*, or umari, is much used by the inhabitants of Brazil on the banks of the Rio San Francisco.

Geophila (*γι*, earth; *φιλεω*, to love).—A genus of dicotyledonous plants belonging to the nat. ord. *Cinchonaceæ*. The species are creeping herbaceous plants, natives of the West Indies and the hot parts of South America. The root of *G. reniformis* is emetic, and may be substituted for ipecacuanha.

Geophilidæ. } A family and genus of insects
Geophilus. } allied to the scolopendras. See CHILOPODA.

Georgina.—A synonyme of the genus DAHLIA.

Geosaurus (*γι*, earth; *σαυρος*, lizard).—A genus of fossil extinct animals belonging to the order *Sauria*, and considered to be intermediate between the crocodiles and monitors. Remains of these animals are found in the solenhofen slate and in the flötz.

Geotrupidæ (*γι*, the earth; *τρυπαω*, to pierce).—A family of lamellicorn coleopterous insects belonging to the section *Petalocera*, comprising a number of species of moderate size, of an almost hemispherical form, and provided with very strong feet, well calculated for digging into

the ground. They are chiefly inhabitants of moderate climates, the greater number being found in Russia, Siberia, Central Europe, and North America, and are generally to be seen from spring to autumn in pastures, amongst the dung of cattle. In such situations they remain buried during the day, and leave only at night. They fly low and heavily, and are said to be extremely sensible to changes of atmosphere. They feign death, like many other beetles, when alarmed; but instead of holding the legs under the body, they rigidly extend them. The insects of this family appear to be of great use in removing from the earth disgusting substances, as the excrementitious matters of man and other animals, which they partly devour and partly disseminate in the earth, by the burrows which they make. They are tormented by a small parasite, *Gamasus coleopterorum*, which infests the under part of the body in great numbers. The type of the family is the common shard-borne beetle, *Geotrupes stercoraceus*, a native of Great Britain. The species of *Lethrus* do great mischief by gnawing off the young shoots of the vines upon which they feed, in the south-eastern parts of Europe. They burrow in the ground, and each burrow is inhabited by a single pair, violent battles sometimes occurring between the male and an intruder of its own sex.

Geraniaceæ (γεράνος, a crane). *The Cranes' Bills.*—A nat. ord of dicotyledonous plants, comprising many species which are either herbs or shrubs, and are scattered over all the temperate parts of the globe, though the greater proportion are found growing in Southern Africa. The family contains many beautiful species, numbers of which are cultivated for their handsome flowers, and are highly prized by horticulturists. There are several genera, such as ERODIUM, PELARGONIUM, and GERANIUM. This latter genus, which gives its name to the family, contains those species which have five petals, all equal and irregular, and ten stamens. They are herbaceous plants, with rose coloured, fine blue, purplish, or white flowers, streaked with rose. The seed capsule is long and awl shaped, and its form has given rise to the English name of cranes' bill. Upwards of seventy species are known, about half of them growing in Europe, of which thirteen are British. Few are of any use in medicine. *G. Robertianum*, herb Robert, fox cranes' bill, or stinking Dick, is very abundant throughout Great Britain. The whole plant has a strong, disagreeable smell, and is said to be a preventive against bugs. It contains tannin, and exerts an astringent action on the system, and is given to cattle in some diseases. *G. maculatum*, spotted cranes' bill, is a native of North America, and contains large quantities of tannin and gallic acid. From its astringent nature it is known in some parts of North America as alum root, and is employed successfully as a remedy in dysentery among children.

Geranium.—A genus of well known plants. See GERANIACEÆ.

Gerbillus.—A genus of animals belonging to the extensive family *Muridæ*, and lately separated as a genus from *Dipus*. The species are small animals, inhabiting the Old World, and are found in Egypt, Persia, the Cape of Good Hope, and West Africa. They live in burrows during the day, coming out at night to seek their food. *G. Ægyptiacus* (*Dipus gerbillus*) is the typical species; is about the size of a mouse, of a clear yellow colour, and inhabits Egypt, being chiefly found about the pyramids.

Gerris.—A genus of insects belonging to the order *Hemiptera*, and family *Hydrometridæ*, and containing a number of species, some of which are very common. These insects are very active, live on the surface of stagnant waters, and skim upon it with great velocity, turning about with the utmost ease. For this purpose the form of their body, somewhat like that of a wherry, is admirably fitted, whilst their long middle feet, brushing along the surface of the water, act as oars. They are covered with a fine close down, which allows them to glide on the water, and even to remain motionless without wetting the body. Their food consists of other insects, and they are able to fly from pond to pond, or from one marsh to another. The larvæ of many species differ only from the perfect insect by being wingless, being even in that state capable of reproduction.

Gervillia.—A genus of fossil bivalve *Mollusca*, belonging to the family *Aviculidæ*. The species were marine shells, generally thick and elongated, with the valves unequal, and sometimes arched. Thirty species have been described, all from the chalk formation.

Gesnera.—A genus of plants named after the celebrated botanist Gesner. See GESNERACEÆ.

Gesneraceæ.—A nat. ord. of dicotyledonous plants composed of herbs and shrubs found chiefly in the hot and damp parts of South America, where they sometimes overrun trees with their rooting stems in the manner of ivy. The genus *Gesnera* contains about thirty species, many of which are remarkable for possessing large flowers of striking colours, and are cultivated as ornaments to the hothouse and conservatory. The prevailing colour of the family is scarlet, but the flowers of some, as *Gloxinia*, are purple.

Gibbsite. *A Terhydrate of Alumina.*—A mineral found at Richmond, in the United States of America, occurring in a bed of iron ore, and appearing to be the result of the decomposition of felspar; it consists of little else than alumina and water.

Gieseckite.—A mineral found disseminated in porphyry rocks in Greenland, and named after Count Giesecké. It is composed of silica, alumina, magnesia, oxide of iron, protoxide of manganese and potash

Gigantholite.—A mineral occurring crystallized in six and twelve-sided prisms, of a green or dark steel-gray colour, and found near Temmela, in Finland. According to some mineralogists, it is a variety of pinite, and derives its name from the large size of its crystals. It is composed of silica, alumina, peroxide of iron, magnesia, protoxide of manganese, potash, and soda.

Gilbertite.—A mineral found near St. Austell, in Cornwall, occurring in whitish-yellow micaceous plates lying irregularly on each other, translucent and of a silky lustre. It is composed of silica, alumina, lime, magnesia, and protoxide of iron.

Gioenia.—A pretended genus of *Mollusca*, founded on the gizzard of *Bulla lignaria*. See BULLA.

Giraffa. *The Giraffe* or *Cameleopard.*—See GIRAFFINA.

Giraffina.—A tribe of ruminant animals belonging to the family *Bovidæ*, and containing only one genus, *Giraffa*. There is only one species of the genus, the well known and singular looking animal called the cameleopard or giraffe, *G. Camelopardalis*. The giraffe is a lofty animal, reaching to the height of about seventeen feet, with a very long neck, but a short body. The lip is entirely covered with hair, much produced before the nostril, and the tongue is long and very extensile; the hinder legs are much shorter than the fore, they have no small hoof, and the tail is elongate, with a tuft of thick hair at the end. The head is provided with two short horns covered with a hairy skin, and united to the bones of the skull by a very obvious suture. A protuberance of the frontal bone, occasioned by the thickening of the bone, has given rise to the idea that the male at least had a third horn. The tongue of the giraffe acts the part of a prehensile organ, being capable of great extension, and evidently very sensitive. The eye is very large, and is so placed that the animal can see much of what is passing on all sides. It feeds upon the leaves and young shoots of trees, especially the species of acacia which abound in the countries where it is found. It is usually a timid inoffensive animal, seldom showing any disposition to injure, except when forced to stand on its defence; it then uses its hinder feet with great effect, and even the lion is said to be driven off by the wounds thus inflicted. It can use its horns also with considerable force, and a female giraffe in confinement has been seen to penetrate with them an inch board. The flight of the cameleopard is very swift, but cannot be long kept up. When it walks it seems to move forward simultaneously the two legs of the same side. Their native country is Africa, being found in Nubia, Abyssinia, and the open plains of South Africa. They live in small troops of eight or ten individuals, and were well known to the ancients.

Gladiolus (*gladius*, a sword). *The Corn Flag.*—A genus of bulbous rooted plants belonging to the nat. ord. *Iridaceæ*. There are a considerable number of species known, many of them cultivated in our gardens for their elegance and beauty. Those we have in our gardens are chiefly brought from the Cape of Good Hope, and the Hottentots eat the tubers or corms of several of the species, the starch which they contain rendering them nutritious. The name of the genus is derived from the ensiform shape of the leaves.

Glæopeltis.—A genus of acotyledonous plants belonging to the nat. ord. *Fucaceæ*. One of the species is a native of China, and furnishes to commerce a glutinous matter, very much used by the Chinese as a glue and varnish. It is extremely tenacious when cooled, and has the advantage of softening again when exposed to heat. The natives of China make lanterns and windows of it.

Glauconome (*glauconome*, a proper name), or **Glaucomya** (*γλαυκος*, green; *mya*, a mussel).—A genus of bivalve shells belonging to the family *Veneridæ*, but natives of fresh water, and found in China and the Philippine Islands. The shells have the dentition and hinge of the *Veneridæ*, but are covered with a dark green epidermis, resembling a good deal that of the family *Cyrenidæ*. About eleven species have been described occurring in the embouchures of rivers.

Glaucopis.—A genus of birds belonging to the conirostral tribe of the order *Passeres* and family *Corvidæ*. It is also known by the name of *Callæas*. The typical species is *G. Cinerea*, the New Zealand crow, and called by the New Zealanders *Kokako*. This bird is of a dark green plumage, with coarse black legs and a strong black beak. Its habits are those of a crow. *G. Temnura*, a species found in Cochin China, has been raised to the rank of a genus, under the name of *Temnurus*.

Glaucus.—A genus of molluscous animals belonging to the order *Nudibranchiata* (= *Gymnobranchiata*), and family *Tritoniidæ*. They are gelatinous animals, elongated, slightly flattened, and terminated posteriorly in a point. The branchiæ are disposed in pairs on the sides, and adapted for swimming, being formed by oblong processes surrounded by digitated appendages. They feed upon smaller animals than themselves, and though not uncommon are impossible to be preserved. When *G. hexapterigius* is seen floating in the water it exhibits a brilliancy of colour and peculiarity of form that is very striking. The back and upper surface of the branchial appendages are of a vivid purple colour, while the abdomen and under surface of the fins are of a beautiful pearly-white. It is about 1¾ inch long, and is found floating in the open ocean.

Glechoma.—The ground ivy. See NEPETA.

Gleditschia.—A genus of dicotyledonous

plants belonging to the nat. ord. *Leguminosæ*, and containing several species of ornamental trees, much esteemed for their elegant foliage, and the varied and picturesque forms assumed by them in their growth. *G. triacanthos*, the three-horned acacia, or honey locust, a native of the Carolinas and Virginia, is a large tree attaining the height of from fifty to eighty feet. The foliage is particularly elegant, and the trunk and branches are covered with hard prickles, which serve as a formidable defence. The sweet pulp with which the seeds are covered, when infused and fermented, forms an intoxicating liquor used by the American Indians.

Glires.—An order of animals belonging to the class *Mammalia*, characterized by their having only two strong cutting teeth in each jaw, separated from the grinders by a space, by their having no canines, and by the condyles of their jaws being longitudinal, thus enabling them to move their jaws from side to side, and in this way triturate their food. They have distinct toes, with small conical claws, and the thumb is sometimes rudimentary. Their mode of progression is generally by leaping, and they feed by gnawing roots, the bark of trees, vegetables, &c. Some have a scaly or spinose tail, and there are scattered spines or larger hairs intermixed with the softer fur. The order contains several large families, as the MURIDÆ, comprising the mice, field mice, the beaver, &c.; HYSTRICIDÆ, or porcupines; LEPORIDÆ, or hares; JERBOIDÆ, the jerboas; and *Aspalacidæ*, or mole rats. See SPALAX.

Glomeridæ.—A family of insects called wood louse millepeds. See CHILOGNATHA.

Glucinum (γλυκυς, sweet).—A mineral substance presenting the characters of a white insoluble earth, soft to the touch, found in beryl and some other minerals of the same kind, as euclase, &c.

Glyceria (γλυκιερος, sweet).—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*, or grasses, comprising several species mostly inhabiting watery places. *G. fluitans*, or flote grass, is common in ditches and stagnant waters, and is a sweet grass of which cattle are very fond. It grows in this country and in most parts of Europe, in the northern countries of which, the seeds are collected and used as an article of food under the name of *Manna Croup*. It is highly recommended as a light nutritious aliment for invalids. It cannot be made into bread, and is only good when boiled. The dried stems are used for making baskets and mats, and for filling mattresses and chairs instead of hair.

Glycimeris.—A genus of bivalve *Mollusca*, belonging to the family *Myadæ*. The valves of the shell are covered with a very thick black epidermis, and gape much at each extremity. The ligament of the hinge is large and prominent, but it has no teeth nor pit. The animal is larger than its shell. Only one or two species are known.

Glycosmis.—A genus of plants. See AURANTIACEÆ.

Glycyrhiza.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and containing several species, one of which, *G. glabra*, is the plant that produces the well known substance called liquorice. This plant is a native of the south of Europe from Spain to Tauria, and of China, and is cultivated in Great Britain, France, Italy, and Germany, for the sake of its roots. These abound in a saccharine, mucilaginous matter, which is obtained by crushing them in a mill, subjecting them to a press, and boiling the juice slowly till it becomes of a proper consistency. It is brought to this country in the form of rolls covered with bay leaves, and is chiefly imported from Spain and Sicily. The average imports for the years 1831 and 1832 amounted to 7,321 cwt. a-year, and as then it was loaded with an oppressive duty, it produced more than £22,000 yearly revenue. It is commonly called Spanish juice and black sugar. The plant is cultivated to a considerable extent in the neighbourhood of Pontefract, and the refined juice is converted into small cakes, well known as pomfret cakes.

Glyptodon (γλυπτος, sculptured; οδους, a tooth).—A genus of extinct fossil animals belonging to the class *Mammalia*, and order *Edentata*, and allied to the modern armadillos. Remains of this animal are found in the vast plains of the Pampas of La Plata, and show it to have been of large size.

Gmelina.—A genus of dicotyledonous plants belonging to the nat. ord. *Verbenaceæ*, comprising several species, all natives of India. They are shrubs or trees, and some of the latter are valuable for their timber. *G. arborea* attains a large size, squaring into logs of from eighteen to twenty-four inches, and nearly thirty feet long. It is called goombar and koomhar by the natives, and is particularly valuable for situations where it is exposed to the combined action of air and water.

Gnaphalium (γναφαλον, a cottony substance).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and consisting of herbaceous plants with heads, the involucres of which are generally covered with a kind of cottony down. Several species grow in Great Britain in waste places, and others are cultivated in our gardens. The flowers are very dry, and keep a long time without perishing—hence they are called in England "everlastings," in France "immortelles." The flowers of one or two species are astringent, and were at one time used in medicine.

Gnathodon (γναθος, a jaw; οδους, a tooth).—A genus of bivalve *Mollusca*, belonging to the family *Mactridæ*. The typical, if not the only species, *G. cuneatus*, is a thick, solid shell, of a cuneiform shape, and covered with an olive or brownish epidermis. It is a native of fresh or

brackish water, and occurs abundantly at New Orleans. At Mobile, on the Gulf of Mexico, it is found in colonies along with *Cyrena Carolinensis*, burying two inches deep in banks of mud. Banks of dead shells three or four feet thick, are found twenty miles inland, and Mobile is built on one of these shell banks. The road from New Orleans to Lake Pont-Chartrain, a distance of six miles, is made of Gnathodon shells procured from the east end of the lake, where there is a mound of them a mile long, fifteen feet high, from twenty to sixty yards wide, and in some places twenty feet above the level of the lake. The animal of this shell was formerly eaten by the Indians.

Gnathostoma (*γναθος*, jaw; *στομα*, mouth). —A genus of animals belonging to the class *Entozoa*, or intestinal worms, and order *Nematoidea*. They are found in small cellular tumors situated immediately beneath the mucous membrane of the stomach of the tiger and leopard.

Gneiss.—The lowest series of stratified primary rocks, composed of quartz, felspar, and mica, arranged in layers. It is a very abundant rock, and according to some statements forms a fourth or fifth part of the surface of the globe.

Gnetaceæ. *Joint Firs.*—A sub-order of dicotyledonous plants belonging to the section *Gymnospermæ* and family *Coniferæ*. It contains two genera, *Gnetum* and *Ephedra*, both of which differ in their habit from the generality of the coniferous plants, but both possessing opposite leaves; in the latter reduced to connate scales, and in the former well developed. The species of *Ephedra* are small decumbent shrubs, slightly training. See EPHEDRA. Those of *Gnetum*, which is the type, inhabit the islands of Asia, and the continent of India. They are lofty trees or branching climbers, and are remarkable for the fruit they bear. The outer integument or episperm of *G. urens*, is filled internally with singular needle-shaped hairs, which, from their stinging powers, cause a violent irritation in the parts which touch them. The seeds themselves, however, are sweet and good to eat, and are known by the name of tali-gnemon by the Malays, and tanquil-assu by the Javanese. The stem exudes a transparent gum, and when cut across yields a large quantity of limpid water fit to drink.

Gobio. *The Goby.*—A genus of fishes. See CYPRINIDÆ.

Gold.—One of the precious metals, softer than silver, and very ductile. Gold is found in a metallic state in nature, sometimes occurring on the surface of rocks in a dendritic form, in the form of gold dust among the sand of rivers, or in the alluvial quartz derived from the primary rocks, chiefly granite, which has been broken up and disintegrated. It is found in most parts of the world, but till lately by far the greater part of the gold of commerce was derived from South America and Asiatic Russia. Now immense quantities are procured from California and Australia. Besides being used as coin, gold is extensively employed in the arts and manufactures, and in Birmingham alone not less than 1,000 ounces of fine gold are used every week. The malleability of gold is very great, and it may be beaten out into leaves so thin, that one grain will cover 56⅔ square inches. These leaves are only $\frac{1}{280000}$th of an inch in thickness, and no other substance is equal to it in ductility. One grain may be drawn out into a wire 500 feet long, and an ounce of gold upon silver is capable of being extended more than 1,300 miles in length. A gold wire 0·078 inch in diameter is capable of supporting a weight of 150·07 lbs. avoirdupois without breaking. Gold was known to man from the earliest antiquity, and the Indus and Euphrates were the spots from which it was first obtained.

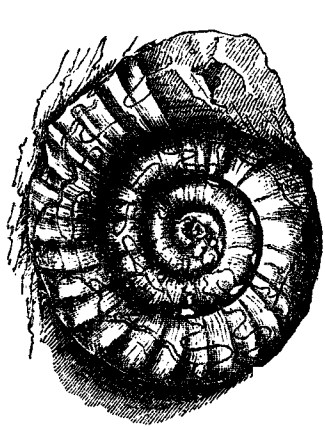
Goliathus.—A genus of beetles. See CETONIIDÆ.

Gomphocarpus.—A genus of plants. See ASCLEPIADACEÆ.

Gomphosis.—A genus of fishes. See LABRIDÆ.

Goniaster.—A genus of star-fishes. See ASTERIADÆ.

Goniatites.—An extinct genus of fossil shells belonging to the class *Cephalopoda*, and family *Ammonitidæ*. The shells are sub-globular, and involute like the nautili;—the sutures lobed, and



Goniatites insignis.

the siphuncle dorsal. The divisions or septa between the chambers are flexuous or angular. About 150 species have been described from the Devonian formation.

Goniopholis.—A fossil crocodile. See CROCODILIDÆ.

Gonium.—A genus of microscopic organisms till lately considered animals and ranked among the *Infusoria*, but now known to be minute

plants belonging to the confervoid *Algæ*, and family *Volvocineæ*. Their appearance is that of square flat fronds, sometimes ciliated and endowed with a power of motion, at other times without cilia and devoid of motion, according, in all probability, to their stages of development. The perfect fronds are composed in general of sixteen cells united together into flat, square masses by adherence at various points of their circumference; and the kinds which are endowed with motion have a pair of vibratile cilia to each cell, the action of which causes a rotatory motion in the water. Their method of increase is by division. The typical species, *G. pectorale*, is not uncommon in stagnant waters, and forms a beautiful object for the microscope.

Gonoplacidæ. — A family of brachyurous *Crustacea*, consisting of a number of species distinguished by the square form of their carapace. The genus *Gonoplax* is the type of the family, one species of which is British. Several species occur fossil.

Gonoplax.—See GONOPLACIDÆ.

Gordius. *The Hair Worm.*—A genus of animals belonging to the class *Entozoa*, consisting of long, slender, and filiform worms, which frequently coil and twist themselves into a knot-like form difficult to unravel—hence the generic name. The most common species in this country is the common hair worm, *G. aquaticus*, from 7 to 10 inches long and about $\frac{1}{25}$ to $\frac{1}{20}$ inch in breadth—the tail in the male being bifid, that of the female simple and rounded. It obtains its English name from its slender, filiform body, and there is a common idea amongst the vulgar, that it derives its origin from the hairs of horses' tails accidentally falling into water, and after macerating some time, assuming the form of worms. The female of the *Gordius* deposits her eggs in the water in long cords which contain many thousands, from which in the course of three weeks the embryos escape, but of a totally different form from the parents. Their body is only the $\frac{1}{450}$th of an inch long, and consists of two portions; the posterior cylindrical, slightly dilated, and rounded at the free extremity, where it is furnished with short spines; and the anterior broader, cylindrical, and annulated, having the mouth furnished with two circlets of retractile tentacula, and a club-shaped proboscis. These larvæ are the prey of insects, such as beetles, and being swallowed by them alive, undergo development in the interior of their bodies.

Gorgonia. — A genus of zoophytes. See ANTHOZOA.

Gossypium. *The Cotton Tree.*—A genus of dicotyledonous plants belonging to the nat ord. *Malvaceæ*, and remarkable for the hairs which surround the seeds. These hairs, when dry, exhibit under the microscope a peculiar twisted appearance, and are known by the name of cotton. Its species are not numerous, though seventeen or eighteen have been enumerated. The most important, and to which most of the described species may be referred as varieties, are—1. *G. Barbadense*, a shrubby plant which grows from six to fifteen feet high, with yellow flowers and oblong black seeds, covered with long, fine, easily separable cotton. The best kind of cotton appears to be produced from this species, and the Sea Island, New Orleans, and Georgian cotton, are obtained from varieties of it. 2. *G. Peruvianum* or *acuminatum*, a native of Brazil, and which furnishes the South American cotton. 3. *G. herbaceum*, a species which is herbaceous in temperate, and shrubby (growing from four to six feet high) in hot climates. The flowers are of a lively yellow colour, with a purple spot near the claw, and the seeds are covered with finely adhering grayish down, under the short staple white wool. This species produces the Indian cotton, and is that chiefly cultivated in India. A variety of it is grown in the Mediterranean region, though originally from Senegambia. The Nankin cotton of China is furnished by another variety of this species. 4. *G. arboreum*, a native of all parts of India, Arabia, and Egypt. It is planted near temples, and habitations of Faqueers in India, and is said to be sacred to the Hindoo deities, and therefore only employed for making muslin for turbans. Next to those plants which furnish man with food, those which produce cotton are amongst the most valuable. The manufacture of cotton cloth seems to have existed in Hindostan from the earliest ages, though it scarcely obtained a footing in Europe till last century. It now forms the principal business carried on in this country, and affords employment for millions upon millions of capital, and for thousands upon thousands of workmen. Taking the average of the five years ending with 1705, the total quantity of cotton wool imported into Great Britain amounted to only 1,170,881 lbs. In 1845, it amounted to 716,000,000 of lbs.! In 1833, it was calculated that the cotton manufacture of Great Britain afforded subsistence to 1,200,000 or 1,400,000 persons. The quality of cotton wool depends on the length, strength, and firmness of the tissue, or, as it is called, the staple; and the varieties in this respect are usually classed under the denominations of *long* and *short stapled*. The Sea Island and Georgian are the best kinds of the long-stapled, and all the cottons of India are short.

Goura.—A genus of pigeons. See GOURINÆ.

Gourinæ. *The Ground Dove family.* A sub-family of birds belonging to the order *Columbæ*, and family *Columbidæ*. The species of this family have the bill lengthened, straight, and slender; their wings short and rounded; and the tarsi and toes generally long and slender. They are mostly found on the ground seeking for grains and seeds, and are natives of most parts of both hemispheres. The genus *Goura* contains two species, which far surpass in size all the others of the pigeon family. *G. coronata*,

the great crowned pigeon, is a magnificent and beautiful bird, inhabiting many of the islands of the Indian Ocean; and is remarkable for having on its head a large, elevated, erect, semicircular, compressed crest of narrow, straight feathers. It builds its nest on trees, and feeds on berries, seeds, and grain. *Goura Victoriæ*, the queen's pigeon,

Goura Victoriæ—The Queen's Pigeon.

named after Her Majesty Queen Victoria, is still larger, and even more beautiful. The head is surmounted by a handsome crest, each feather being spread out into a spatulate or spoon-shaped form at its extremity, where the colour is blue, bordered with white.

Graculinæ. *The Grakles.*—A sub-family of birds—synonymous with *Eulabetinæ*. See STURNIDÆ.

Graculus.—A genus of birds. See PHALACROCORAX.

Gradientia.—A section of animals belonging to the BATRACHIA.

Grallæ, Grallatores. *The Wading Birds.*—An order of birds containing those which have long slender legs, and the lower part of the thighs naked. Some of them have short wings, which assist them in running, such as the ostriches, see STRUTHIONIDÆ; others have long wings and fly well, such are the bustards, see OTIDÆ; the cranes and herons, ARDEIDÆ; the snipes, SCOLOPACIDÆ; and the rails, RALLIDÆ. Footmarks of gigantic wading birds have been found in the new red sandstone formation.

Gramineæ.—A nat. ord. of monocotyledonous plants belonging to the sub-class *Glumaceæ*, and containing all those plants known by the name of grasses. This is one of the most important orders of the vegetable kingdom to man and animals. The different species of cereals which constitute almost the sole food of millions of human beings, and which enter largely into the subsistence of all, such as rice, wheat, oats, barley, maize, &c., &c., belong to this order, and the various pastures which afford nourishment to our cattle are formed by grasses. Besides these indispensable products, we derive from this order our sugars; and the gigantic tree-like grass of tropical climates, the bamboo, so valuable in India and China, belongs also to the *Gramineæ*. Grasses grow in all quarters of the globe, being found from pole to pole, and generally grow in large quantities together, so as to obtain the name of social plants. The species are numerous, upwards of 3,800 having been described; and they are said to form about $\frac{1}{12}$ part of known plants.

Grammitis.—A genus of ferns, synonymous with CETERACH.

Granite.—One of the most abundant rocks seen on the surface of the earth, and consisting of quartz, red or white felspar, and mica in black plates. The colour of this rock varies considerably, according to the colour of the felspar contained in it, and the quality depends upon the size of the crystals of felspar and mica, which are its component parts. Besides these three substances, other minerals are occasionally found in granite, such as *Pinite*, which in some localities, as in Ardiéche, constitutes a twelfth of the rock. It is with this variety that the streets of Paris are principally paved. *Amphibole* is also sometimes found in granite, but always in small quantity, and the presence of this mineral forms the passage to *Syenite*. Granite never contains any organized bodies, and is never stratified. It is extensively used for building, paving, and decorations. Aberdeen is built and paved almost entirely with gray granite, and the red granite, taking a fine polish, is chiefly used for the purposes of decorative art. The strong fortresses of Russia, in the Baltic and Black Seas, are built of granite.

Grantia.—A genus of sponges, named after Professor Grant. There are seven British species, all marine, found growing upon, or from rocks, sea-weeds, shells, &c., between tide marks. See SPONGIIDÆ.

Graphipterus.—A genus of pentamerous *Coleoptera* belonging to the family *Carabidæ*, and containing several species which are wingless, and inhabit Africa, and the parts of Asia contiguous to it. Some are black, with white spots; others are brown, or reddish, with gray streaks. The first are found in Egypt, or in the neighbouring countries, the others are from the Cape of Good Hope, or west coast of Asia. Those species found in Egypt are always observed during the day, running in the sand of half cultivated places. The rubbing of their hind thighs against the edge of their elytra produces a peculiar noise which resembles the word "xéxé," very briskly repeated. This noise leads very easily to their retreats, where they apparently live in society, and sometimes in great numbers.

Graphite. *Black Lead, Plumbago*, or *Wad.*—A mineral of a dark steel-gray colour, and metallic lustre, containing from ninety to ninety-six per cent. of carbon. It has a soft greasy feel, and leaves a dark stain when drawn along paper. It occurs, in a state of purity, only in Borrowdale, Cumberland, in mines which have been wrought since the days of Queen Elizabeth. It is found in detached pieces, and not in veins. Of late years the supply has been scanty, and the mineral of an inferior quality. This lead is now almost wholly employed in making pencils, an inferior variety from Spain and Ceylon being used in the manufacture of crucibles, polishing cast iron utensils, diminishing friction, and other uses to which genuine black lead was formerly put. Much of the black lead now used is, however, manufactured of a mixture of plumbago powder and tersulphide of antimony. These are ground together to a fine powder, and then exposed in a clay crucible to an intense heat. When cooled, the material is removed, subjected to great pressure, and then sawn into slices for pencils. Graphite is generally found in primary, or transition rocks. In Borrowdale it occurs in greenstone; in Inverness-shire, in gneiss; at Arendal in Norway, in quartz rock, and in the United States, in felspar and mica slate.

Grapsus. *Painted Crab.*—A genus of decapodous short-tailed *Crustacea*, belonging to the family *Ocypodidæ*. The carapace in this genus is nearly quadrilateral and depressed, with the front very wide and strongly recurved. The species live on rocky shores, and are widely distributed. They run with great swiftness, and are very timid. One species which has been lately formed into a separate genus, *Nautilograpsus*, is found in the ocean in great quantities, living on the sargasso, or gulf weed, *Fucus vagans*. It is called the sailor crab, *Nautilograpsus minutus*, and it is recorded that Columbus, in his first voyage to discover America, finding this little crab alive on the gulf weed, concluded that he was not far from land, and was thereby encouraged to proceed on his voyage. The typical species, *Grapsus pictus*, painted, or red mottled crab, inhabits the West Indies, living on the rocks overhanging the sea, and runs with surprising agility along the upright sides, and even under rocks that hang horizontally over the water.

Graptolites (γραπτος, written; λιθος, a stone.)—A family of fossils referred to the class *Zoophyta*, and order *Anthozoa Hydroida*. They were most probably species of the family *Sertulariidæ*, though their exact position is still unsettled. They form some of the most distinguishing fossils of the silurian strata.

Gratiola.—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, comprising a number of species which are herbaceous, growing in muddy places, and inhabiting the central countries of Europe, North America, and extra-tropical New Holland. About thirty species are known, of which *G. officinalis*, or hedge hyssop, is the only inhabitant of Europe. It grows in marshy grounds, has a bitter taste and a nauseous smell. The leaves are bitter and acrid, and possess an emetic and purgative property. In some parts of France the country people use them for the latter purpose, and hence the plant is called "herbe á pauvre homme." It is said to enter into the composition of the Eau médicinale, so much vaunted as a remedy for gout. It is apt, however, to produce violent irritation when incautiously used; and cattle, when they feed upon it, are observed to lose flesh very rapidly.

Grauwacke, or Graywacke.—A sandstone rock composed of quartz, felspar, lydian stone, and clay slate, and filled with metallic veins. The felspar composes about four-fifths of its substance. The grauwacké rocks belong to the transition series, and are the lowest of the fossiliferous rocks, containing occasionally fragments of spirifers and plants. They usually form fine rounded pastoral hills, as in the south of Scotland and the north of England.

Greenstone.—A rock consisting of a mixture of green hornblende and albite, and known by the names of *whin* and *trap*. See also DIORITE.

Gregarina.—A genus of microscopic animals, indistinctly known as yet, but referred to the class *Entozoa*, or intestinal worms. They are found within the intestinal canal or abdominal cavity of various animals, as insects, especially larvæ, annelides, crustacea, and mollusca. There are many species described, very minute creatures, possessed of slow motion, and having vibratile cilia upon both outer and inner surface of the membrane.

Grewia.—A genus of dicotyledonous plants belonging to the nat. ord. *Tiliaceæ*, and named after the celebrated botanist, Dr. Grew. The species are mostly found in the tropical islands and hot parts of the Old World. Like the rest of the family to which they belong, the inner fibre of the bark possesses a remarkable degree of tenacity, and the bark of *G. oppositifolia* is in consequence employed for making ropes in the Himalayas. The wood of *G. elastica*, called dhamnoo by the Indians, is valued for its strength and elasticity, and several other species, also natives of India, afford a pleasant sub-acid fruit, which is used for making sherbet.

Grias.—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, and containing only one species, called the anchovy pear, *G. cauliflora*. This is a tall tree with few branches, very long oblong leaves, and large white flowers, and grows in Jamaica. The fruit, an ovate berry, is the size of an alligator's egg, of a brownish-russet colour, and is eaten as a pickle, in the same way as the mango.

Grislea.—A genus of dicotyledonous plants belonging to the nat. ord. *Lythraceæ*, and con-

taining three species, the best known and most useful of which is the dhaee of the Indians, *G. tomentosa*, a native of most parts of India. The calyx is bright red, and very showy, and the flowers form an article of commerce, being collected by the natives of India and employed by them for dyeing a red colour.

Grisonia. *The Grison.*—See GULO.

Grossulariaceæ. *The Gooseberry and Currant family.*—A nat. ord. of dicotyledonous plants, containing many species which are shrubs, either unarmed or spiny, and bearing a berry which is one-celled, the cell filled with pulp, and the numerous seeds suspended amongst it by long filiform cords. They are natives of the mountains, hills, woods, and thickets of the temperate parts of Europe, Asia, and America. There are only two or three genera contained in this order, though the known species amount to about 100; the gooseberry and currant are amongst the best known. See RIBES. The genus *Polyosma* is the representative of the family in the South Sea Islands and tropical Asia, and is remarkable for the exceeding fragrance of its flowers, hence its name.

Gruidæ. *The Cranes.*—A family of birds belonging to the order *Grallæ*, distinguished by having a rather short hind toe, much higher on the legs than the front ones, and a strong, hard, rather long beak, with the nostrils in the front of a broad groove. They are divided into two sub-families, *Psophinæ* and *Gruinæ*.

Gruinæ.—A sub-family of birds belonging to the family *Gruidæ*, containing the true cranes and balearic cranes, for an account of which, see ARDEIDÆ.

Grus. *The Crane.*—See ARDEIDÆ.

Gryllidæ. *The Grasshoppers.*—A family of saltatorial *Orthoptera*, containing those insects familiarly known to us by the name of grasshoppers. French entomologists apply this name

Grasshopper.

to the family which contain the crickets, but which, according to English authors, belong to the family ACHETIDÆ. The *Gryllidæ* are characterized by their legs and antennæ being very long and slender, the wings large and delicate, and the wing-covers often extending far beyond the extremity of the abdomen. In the male insects these wing-covers are furnished at the base, near the suture, with a round tail-like plate surrounded by strong ridge-like veins; and the chirping or stridulous noise peculiar to the family is produced by rubbing the bases of the wing-covers sharply over each other, these ridges serving the purpose of a sort of drum. The females do not possess this structure, and are therefore mute, and the object of the stridulation possessed by the males is to call the females to them. The female is furnished with an ovipositor, which she thrusts to a considerable depth into the earth, and there deposits her eggs. The young insects, when hatched, are like their parents, but are destitute of wings. Grasshoppers live upon plants, and mostly prefer damp situations. When full grown they are ordinarily of large size, the common great green grasshopper of this country, *Phasgonura* (*Gryllus*) *viridissima*, being one of our largest native insects, measuring about two inches in length, and three and a-half in the expanse of its wings. *Decticus verrucivorus*, which is rare in Britain, is common in Sweden, and the native peasants employ it to bite the warts on their hands; the black fluid which it emits from the mouth being supposed to possess the power of making these excrescences vanish. Many of the exotic species of the family present singular resemblances to the leaves of various plants, as the laurel, lily, myrtle, &c.

Gryllotalpa (*gryllus*, a cricket; *talpa*, a mole). *The Mole Cricket.*—A genus of crickets. See ACHETIDÆ.

Guaiacum.—A genus of dicotyledonous plants belonging to the nat. ord. *Zygophyllaceæ*, and comprising several species, all of which are trees or shrubs, natives of the West Indian islands, in low places near the sea. *G. officinale* is a beautiful tree, with pinnate leaves, and fine bright blue flowers, growing in small axillary clusters. The wood is very hard, compact, of a blackish-green colour, and is known by the name of *lignum vitæ*. The fibres of this wood are remarkable for their direction, being cross-grained, in consequence of one layer crossing another diagonally. This tree produces the gum resin used in medicine, called *Guaiacum*. It exudes spontaneously, or it may be procured by incisions, or by the application of heat. This gum is employed as an alterative and diaphoretic. The wood is the heaviest timber we know; it is exceedingly difficult to work, as it can scarcely be split, but breaks into pieces like a stone. It is admirably adapted for the sheaves or pulleys of blocks, for friction rollers and castors, and for stampers and mallets. Being full of the resin it is proof against decay, as water cannot penetrate it.

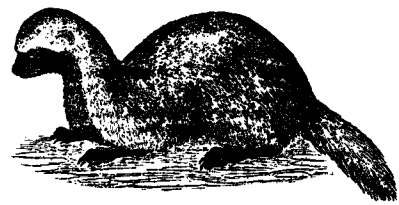
Guano.—A substance now made much use of by agriculturists as a fertilizing manure, and consisting of the accumulated excrements of sea fowl, in a more or less decomposed state. It contains ammoniacal salts, phosphate of lime and magnesia, soluble salts, as phosphate and sulphate of potash, and chlorides of potassium and sodium, &c. It has been used for ages as a manure by the Peruvians, who call it *huano*, but has only of late years been introduced into Europe. Guano contains great quantities of *Diatomaceæ*.

Guazuma.—A genus of dicotyledonous plants growing in the West Indies, the wood of which is used for making sugar casks, to be imported to this country. See BYTTNERIACÆ.

Gueparda. *The Cheetah.*—A species of leopard. See FELINÆ.

Gulielma.—A genus of palm trees, natives of America. The peach palm, or pupúnha of the natives, *G. speciosa*, is a picturesque and elegant palm, growing quite erect, and reaching a height of sixty feet. It inhabits the regions near the Andes, Peru, and New Grenada, but is now cultivated by the Indians in all parts. The numerous leaves form a nearly spherical crown to the stem, and the whole mass of foliage presents a singularly plumy appearance. The fruit is about the size of an apricot, of a triangular oval shape, and fine reddish-yellow colour. They are eaten either boiled or roasted, when they sometimes resemble Spanish chestnuts, but have a peculiar oily flavour. They are also ground down into a kind of flour, and made into cakes, which are roasted, like Cassava bread; or the meal is fermented in water, and forms a sub-acid, creamy liquid. The stems of the trees are thickly set with long, needle-shaped spines, disposed in rings or bands, and the wood, when old, is black and exceedingly hard, turning the edge of any ordinary axe.

Gulo.—A genus of animals belonging to the class *Mammalia*, and family *Mustelinæ*; remarkable for combining the well developed dentition of the carnivorous *Felidæ* with the plantigrade foot of the *Ursidæ*. The glutton or wolverene, *G. luscus*, at one time enjoyed a marvellous character for inordinate voracity and extraordinary cunning. It is about the size of a large badger, and is found throughout the whole northern parts of the American continent, from the coast of Labrador and Davis' Straits to the shores of the Pacific and the islands of Alaska. It is a mischievous animal, and annoys the martin-hunters, by rendering their traps unserviceable, merely to get at the bait. It is so suspicious that it will rarely enter a trap itself, but beginning behind, pulls it to pieces, scatters the logs of which it is built, and then carries off the bait. It feeds also on



Gulo (Grisonia) vittatus—The Grison.

meadow mice, marmots, and other small animals, and appears to feed well, for it is generally fat. It resembles the bear in its gait, is not fleet, and though it is said to defend itself against the attacks of other quadrupeds, flies from the face of man. The skin of the wolverene is not of much value. The grison, *Gulo vittatus* = *Galictis vittata*, Bell, or *Grisonia vittata*, Gray—is a native of the warmer parts of America, as the Brazils, &c., and is much smaller than the preceding, being only about one foot six inches in length. It is a sanguinary species in a wild state, committing great devastation amongst smaller quadrupeds, but is said to be easily rendered tame, and to be very playful in domestication. They have two glands, situated in the anus, about the size of nutmegs, containing a fluid about the consistence of honey, but of a most disgusting smell, and which they can eject when irritated.

Gulo luscus—The Glutton.

Gunnera.—A genus of plants. See ARALIACEÆ.

Gutta Percha or **Pertsha.**—A gum resin, the product of *Isonandra gutta*, a tree belonging to the nat. ord. *Sapotaceæ*, and growing in India, especially in Sumatra and the neighbouring islands. See ISONANDRA.

Guttiferæ. *The Gamboge family.*—See CLUSIACEÆ.

Gyges.—A genus of microscopic organisms belonging to the vegetable kingdom, class *Acotyledones*, nat. ord. *Algæ*, and family *Volvocineæ*.

Till lately this genus was considered to belong to the infusorial animals, but, as has now been ascertained, seems to differ very little from the genus *Protococcus*.

Gymnema.—A genus of plants. See ASCLEPIADACEÆ.

Gymnetrus.—A synonym of REGALECUS.

Gymnocladus (*γυμνος*, naked; *κλαδος*, branch).—A genus of dicotyledonous plants belonging to the nat. order *Leguminosæ*. The only species belonging to this genus is *G. Canadensis*, known as the Kentucky coffee tree. The branches of this tree are without any appearance of buds, and the tree in winter appears to be dead, hence the Canadians call it the stump tree. The wood is hard, compact, of a fine rose colour, and is used in America for cabinetmaking and carpentry. At one time the seeds were roasted and used in Kentucky by the natives as a substitute for coffee. The pods, preserved in the same way as tamarinds, are said to be wholesome and aperient.

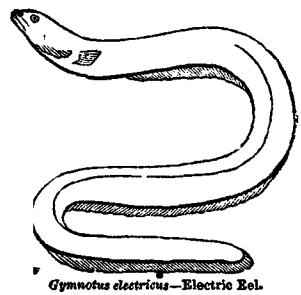
Gymnoderinæ.—A sub-family of birds. See CORVIDÆ.

Gymnorhinæ.—A genus of birds. See CORVIDÆ.

Gymnospermæ (*γυμνος*, naked; *σπερμα*, seed).—A division of dicotyledonous or exogenous plants, characterized by having naked ovules, which are fertilized by the direct application of the pollen to the foramen, without the intervention of stigma, style, and ovary. In this respect, gymnosperms are analogous to those reptiles in the animal kingdom, which have eggs that are impregnated by the male after they have been deposited by the mother. The most remarkable orders of the division are CONIFERÆ and CYCADACEÆ.

Gymnotidæ.—A family of apodal malacopterygious fishes, distinguished from the others of the order by having their fin rays jointed or branched. They have, however, neither dorsal nor ventral fins. Their jaws are complete, and they are furnished with ribs from the fifth vertebra onwards, which encompass the belly, and in many species are perceptible through the skin. One of the most curious parts of their structure, however, is the forward position of the vent, which in some species is situated before the eye. The species are eel-like in shape and appearance. The family is best represented by the genus *Gymnotus*, which see.

Gymnotus (*γυμνος*, naked; *νωτος*, back).—A genus of malacopterygious fishes forming the type of the family *Gymnotidæ*, and characterized by having the gill-flap covered with a membrane which opens in front of the pectoral fins. The anal fin extends under the greater part of the body even to the end of the tail, but the back is naked, being entirely destitute of a fin. Several species are described, but the best known is the electric eel, *G. electricus*. This fish has a disagreeable appearance, is from four to five feet in length, and bears a general resemblance to a large eel, with a broad, depressed, obtuse head, and a compressed tail. The skin is free from scales, and is of a blackish colour, relieved by several rays of a still deeper hue. It is a native of the larger rivers and fresh lagoons of the



Gymnotus electricus—Electric Eel.

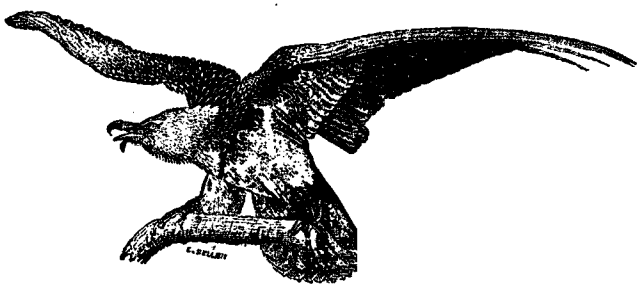
warmer parts of South America, Guiana, Surinam, Cayenne, Demerara, Guayaquil, the Brazils, &c., and is famed for its extraordinary electric powers. A single eel is said to possess sufficient, when in full vigour, to knock a man down, and Humboldt tells us that he has seen two horses killed in five minutes when exposed to the attacks of a number of these fishes. The natives capture them by driving a number of horses into the water which they inhabit, and when they have exhausted their electric powers by striking the horses repeatedly, the Indians harpoon them and draw them ashore. The electric eels are so abundant in some parts of South America, that in the neighbourhood of Uritucu, a route at one time much frequented, has been entirely abandoned, in consequence of the necessity of fording a stream in which many mules were killed every year by these subaqueous electric shocks.

Gymnura (*γυμνος*, naked; *ουρα*, tail). *The Bristly Shrew.*—A genus of animals belonging to the class *Mammalia*, order *Feræ*, and family *Talpidæ*. Only one species is known. This curious animal, *G. Rafflesii*, which is named after Sir Stamford Raffles, is a native of Sumatra, and in its dentition, and its back covered with bristly hair, is closely allied to the hedgehogs, while in its long, naked, scaly tail, and pointed muzzle, it approaches the shrews. It feeds upon insects chiefly.

Gynocardia.—A synonym of *Hydnocarpus*. A genus of plants. See FLACOURTIACEÆ.

Gypaetos (*γυψ*, vulture; *αιτος*, eagle).—A genus of rapacious birds belonging to the order *Accipitres*, and family *Vulturidæ*. It is distinguished by having, like the vultures, small eyes on a level with the head, talons proportionally weak, and the crop projecting at the base of the neck when full, while its head, as in the eagles, is entirely covered with feathers, and it prefers living to dead animals for food. The beak is

strong, straight, swollen, and curved at the tip, the nostrils covered with stiff hairs directed forwards, short tarsi feathered to the toes, weakly hooked claws, long wings and a pencil of stiff feathers under the beak. The only species known is the lämmergeyer or bearded griffin, *G. barbatus*, the largest rapacious bird of the Old World. When full grown, its plumage is blackish with a white line along the middle of each feather. The neck and under part of the body are of a clear bright fawn colour, and a black band surrounds the head. It is about four feet seven inches in size, and nine or ten (and individuals have even measured fourteen) feet in extent of wing. It is a powerful and bold bird, and lives upon young animals, as lambs, young chamois and other



Gypaetos barbatus—The Lammergeyer.

deer, and even calves, which it has strength enough to throw on the ground. It is said to be able to carry off lambs and young children in its strong grasp, but its short talons and weakly hooked claws do not adapt it for keeping hold of its prey while flying. In general it is as cunning as bold, and waiting till it sees its prey separate itself from the rest of the flock, and approach some precipice, it darts upon it with great swiftness, and striking it with its talons and wings, it hurls it over the brink, then pounces upon it with the rapidity of lightning. It eats skin and bones, and rejects them afterwards in the form of pellets. If live prey be wanting, and if it be pressed with hunger it will eat carrion. It resides chiefly on the high mountains on the verge of perpetual snow, building its aerie on the most inaccessible rocks. The Alps of Switzerland, the Tyrol, and Sardinia, are its native haunts, but it is also met with in Egypt, Syria, the Cape of Good Hope, and Siberia. It flies powerfully, rising high in the air and making circles before it descends.

Gypohierax.—A genus of birds. See RACAMA.

Gypogeranus.—A genus of birds synonymous with Serpentarius, and containing the secretary bird. See SERPENTARIUS.

Gypsum. *Sulphate of Lime. Selenite.*—A mineral substance ordinarily white or colourless, generally in a crystallized state, of a lamellar structure, and soft. It is a hydrated sulphate of lime, consisting of one atom of sulphuric acid and one of lime. When exposed to a moderate heat it parts with its water, and is converted into a dull white earthy substance, well known as plaster of Paris. There are various kinds of gypsum, as fibrous gypsum, or satin spar; saccharoid gypsum, or ALABASTER; SELENITE, and radiated gypsum; and compact gypsum, which forms the Paris plaster. This, when powdered and mixed with water and glue, becomes stucco. Sulphate of lime is an abundant component of the earth's strata. It is found in layers in the magnesian limestone, abounds in the London clay, and is a prominent constituent of many tertiary deposits, as that of Paris. It is constantly present in the river and spring waters of Great Britain, as the Thames, the springs of Bath and Bristol, &c., and in the river Seine in France. Besides its utility as plaster of Paris, for making casts, covering the outside of buildings, &c., sulphate of lime has been found very useful as a manure.

Gyrinidæ (*γυρεύω*, to turn round).—A family of insects belonging to the pentamerous *Coleoptera*, and section *Hydrodephaga*, or water beetles. The type of the family is the genus *Gyrinus*, the species of which are generally very small, with an oval body, more or less convex, and with feet perfectly organized for swimming. They generally live on the surface of the water, and move about with such celerity in a gyrating or circular manner, that it is difficult to follow them with the eye. They are called tourniquets by the French, and whirligigs by the English. They are generally of very brilliant bronze metallic colours, and when the sun shines on them they look like pearls dancing on the surface of the water. Sometimes they stop short, appear immovable, and look as if they were easily to be caught, when all at once they disappear with the rapidity of lightning, darting from one point to another, or plunging perpendicularly in the water. When laid hold of they exude from their body a milky fluid of an extremely strong and disagreeable odour, which remains for a length of time afterwards. The female deposits

her eggs upon the surface of the leaves of aquatic plants. The larvæ are of a peculiar form, and have some resemblance to those of some of the neuroptera, as the *Ephemeridæ*, &c. They have a series of appendages inserted on the sides of the rings of the abdomen, which float out and give them at first sight the look as if they were *Scolopendræ*. These appendages are branchial, serving the purpose of respiration. The larvæ, when full grown, leave the water, and taking up their abode upon the leaves of aquatic plants, spin a cocoon, in which they undergo their transformations. These being completed they tumble off the leaves into the water. The typical species the common whirligig, *Gyrinus notator*, is abundant on the surface of ponds and rivers in this country.

Gyrinus.—A genus of water beetles. See GYRINIDÆ.

Gyrocarpus (*γυρόω*, to turn round; *καρπος*, fruit).—A genus of dicotyledonous plants belonging to the nat. ord. *Combretaceæ*. The few species that are described are trees, and grow in India, South America, and Australia. The fruit is furnished with two long membranous rings, and

boys are in the habit of playing with them, throwing them up high in the air, and seeing them descend slowly and with many gyrations. Hence the name of the genus. The Indian species is a native of the Coromandel coast. The wood is very light, and is much prized by the natives for constructing the catamarans, or rafts on which they come off to ships through the heavy surf of the Madras coast.

Gyrodus (*γυρος*, round; *ὀδους*, a tooth).—A genus of fossil fishes found in the oolite. Little but the teeth have been found remaining, and these are round, fixed on the palate, and formed for grinding down hard crustacea and fish with bony scales. When found loose they were described by the early writers on organic remains as distinct organisms under the name of *Bufonites*.

Gyronites (*γυρος*, round; *γωνια*, angle).—Small fossil bodies found in fresh water tertiary strata, at one time considered to be foraminifera, but now known to be the seeds of the genus *Chara*.

Gyrophora.—A genus of lichens. See THALLOGENÆ.

H

Habzelia.—A genus of dicotyledonous plants belonging to the nat. ord. *Anonaceæ*, several species of which have fruit possessing a pungent aromatic taste, and are often substituted for other spices. The fruit of *H. Œthiopica*, a native of Sierra Leone, is sold in the shops under the name of *Piper Œthiopicum;* and that of *H. aromatica*, a native of Guiana, is used by the natives as a condiment.

Hæmanthus (*αἷμα*, blood; *ανθος*, a flower).—A genus of monocotyledonous plants belonging to the nat. ord. *Amaryllidaceæ*, consisting of a number of bulbous rooted plants, with handsome fine red flowers, several of which are cultivated in our hothouses and conservatories for their beauty. Most of them are natives of the Cape of Good Hope, though some grow in tropical Africa. The species most frequently met with in cultivation is *H. coccineus*, the Cape tulip; it is a showy plant with two broad leaves spread on the surface of the ground, and a naked stem terminated by an umbel of about twenty or thirty fine red flowers, which are surrounded by a spathe, consisting of six red bracteæ. The root of one of the species, *H. toxicarius*, is poisonous.

Hæmatite.—An ore of iron. See FERRUM.

Hæmatococcus (*αἷμα*, blood; *κοκκος*, a grain).—A genus of minute acotyledonous plants belonging to the nat. ord. *Algæ*, and containing several species, some of which, as *H. sanguineus*, have the cells coloured red. They are found upon moist rocks, on the walls of caverns, and in damp places.

Hæmatopus. *The Oyster Catcher.*—A genus of birds. See CHARADRIIDÆ.

Hæmatoxylon (*αἷμα*, blood; *ξυλον*, wood).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Cæsalpineæ*, and containing one species which is well known as the logwood. This species, *H. Campeachianum*, is a tree common in tropical America and over all the West India islands, and the wood forms an article of considerable commercial value. It attains its greatest perfection at Campeachy, in the Gulf of Mexico, but is generally a low spreading tree, with a crooked and deformed stem seldom thicker than a man's thigh. The wood is hard, compact, heavy, and of a deep red colour internally, which it gives out both to water and alcohol. It is extensively used for dyeing, though the colours are not particularly durable. At an average, for the three years ending 1832, the entries for home consumption amounted to 10,973 tons yearly. In the reign of Queen Elizabeth, logwood was prohibited to be used as a dye, as at that time the colours were found to be extremely fugacious, and it was not till the time of Charles II. that this prohibition was repealed. The colouring virtue depends upon the presence of a principle called hæmatoxyline or hæmatine.

Hæmodoraceæ. *The Blood Root family.*—A nat. ord. of monocotyledonous plants, consisting of various species of herbs with fibrous roots entire ensiform leaves, and tubular bisexual flowers which are often covered with an appearance of wool. They are found in various parts

of the world: as in Australia, the Cape of Good Hope, and America. The roots of many contain a red colouring principle which renders them useful in dyeing, though unfortunately the colour is fugacious. The roots of *Hæmodorum paniculatum* and *H. spiratum*, plants which grow at Swan River, Australia, are used as food by the natives, and though acrid when raw, are mild and nutritious when roasted. The species of *Vellosia*, or the tree lilies, give a decided feature to the vegetation of the mountains of Minas Geraes, in Brazil. Their trunks are covered by the withered remains of the leaves, and their branches are dichotomous and bear tufts of leaves at their extremities, while the outer surface of their stems is covered thickly with numerous adpressed rootlets. *Aletris farinosa* furnishes one of the most intense bitters known.

Hæmodorum.—See HÆMODORACEÆ.

Hæmopis (*αἷμα*, blood; *ωψ*, appearance).—A genus of annelides belonging to the family *Hirudinidæ*. See ANNELIDA.

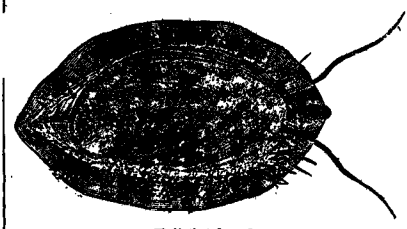
Halcyon.—A genus of birds belonging to the family of king-fishers, and containing those species which have their lengthened bills inflated at their sides. They feed on insects, and some of them upon crustacea, which has procured for them the name of "crab-eaters." See ALCEDINIDÆ.

Halesia.—A genus of dicotyledonous plants belonging to the nat. ord. *Styracaceæ*, and containing several species, which are called snowdrop trees. *H. tetraptera*, the common snowdrop tree, is a native of South Carolina, and grows to the height of from fifteen to twenty feet. It has fine white flowers, from nine to ten in a bunch, which droop gracefully, and resemble those of the snowdrop. The wood is hard and veined, and the tree is one of the hardest and handsomest of all the deciduous trees of America.

Haliæetus. *The Bald Eagle.*—See AQUILINÆ.

Halicore. *The Dugong.*—A genus of cetaceans. See MANATIDÆ.

Haliotis (*ἅλιος*, sea; *ους*, ear). *The Sea Ear-shell.*—A genus of molluscous animals belonging to the class *Gasteropoda*, order *Scutibranchiata*, and forming the type of a small family, *Haliotidæ*. In their general form, and the manner in which they adhere to the rocks, the ear-shell somewhat resembles the *Patellæ*, or limpets. They are flattish, largely open, and terminated behind by a slightly projecting spire, composed of only a few whirls. Above the edge of the left hand border the disc is perforated with a row of holes somewhat tubular, which commence at the summit and terminate towards the anterior extremity of the shell. Those at the summit become closed up as the shell grows older, whilst those at the lower extremity are open, and give outlet to a series of tentacula which ornament the animal's foot. In contour they resemble the form of the human ear, and though many are rough and rude externally, they are gorgeous within, resplendent with a beautiful nacreous lustre of many hues. Some of the species are very large and brilliant, and the finest and largest are natives of warm climates. The animals of several are eaten. That of *H. Iris*, a native of New Zealand, is called by the natives the mutton fish; and that of *H. tuberculata*,



Haliotis tuberculata.

found in the Mediterranean and on the shores of the Channel Isles, at one time formed part of the food of the natives of Guernsey. Possessing a fine nacre, they are extensively used in the manufacture of papier maché articles and mother-of-pearl ornaments.

Halithæa.—A genus of marine annelides. See ANNELIDA.

Halloylite or **Halloysite.**—A mineral substance found at Liége, and at Bayonne, in France, and named after the French geologist d'Halloy. It is white and compact, of a waxy lustre and conchoidal fracture, and its specific gravity is 1·8 to 2·1. It is composed of silica, alumina, and water. It resembles steatite, yields to the nail and may be polished by it, and adheres to the tongue.

Halmaturus.—A genus of kangaroos. See MACROPIDÆ.

Haloragaceæ. *The Mare's Tail family.*—A nat. ord. of dicotyledonous plants containing a number of species, some of which are aquatic and common in most parts of the world, especially the temperate regions, such as the genera *Hippuris* and *Callitriche*, &c. Others approach to a shrubby structure, grow on dry land, and are chiefly found in New Holland and tropical Asia, such as *Haloragis*, &c. A species of *Hippuris*, *H. vulgaris*, or common mare's tail, is very common in ditches and slow streams in Great Britain and North America.

Halteres. *Balancers.*—Two small membranous appendages, which are moveable, very slender, more or less elongate, inserted on each side of the metathorax of the insects belonging to the order *Diptera*. They consist of an elongated style or thread, and a rounded little head, which is generally compressed; but the form and figure vary much, according to the tribes or genera of the insects possessing them. There is

great difference of opinion amongst entomologists as to the use of these organs. They exist in all dipterous insects, are generally kept in constant vibration, and must therefore be of importance to them; but the exact part of the body from which they take their origin is equally disputed as the use to which they are applied; some consider them to be attached to the segment which bears a pair of spiracles, and believe their use to be connected with the function of respiration; others consider them to be attached to the true metathorax, and assert that they are the representatives of the posterior pair of wings. This latter opinion is the one held by English authors of late, and perhaps is the most correct.

Haltica.—A genus of beetles, including the species well known as the turnip fly. See GALERUCIDÆ.

Hamites (*hamus*, a hook).—A genus of fossil cephalopodous *Mollusca*. See AMMONITIDÆ.

Hapalotis. *The Rabbit Rat.*—A genus of mice. See MURINA.

Harmotome (ἁρμος, a joint; τεμνω, to cut).—A mineral substance occurring in amygdaloidal rocks at Kilpatrick, Strontian, and in the Hartz. Its specific gravity is 2·390 to 2·45, and it is composed of silica, alumina, barytes, lime, soda or potash, and water.

Harpa. *The Harp Shell.*—A genus of molluscous animals belonging to the class *Gasteropoda*, and family *Olividæ*, and remarkable for the elegant form of the shell, which resembles, in the disposition of the ribs which adorn its external surface, the form of a harp. The animal has a very large, flat, and broad foot, crescent-shaped in front, nicked on each side, and pointed behind. This posterior part separates spontaneously when the animal is irritated, or when suddenly alarmed and wishing quickly to withdraw its whole body within the shell. It has no operculum. The harp shells are great favourites amongst shell collectors, as they are generally remarkable for the beauty and high polish of their surface and the brilliant colours which adorn them. They are mostly obtained from deep water and soft bottoms, and are natives of the warm seas of Asia and the Pacific. Nine species are described recent, and four fossil, from the eocene formations.

Harpactidæ.—A family of *Entomostraca*. See COPEPODA.

Harpalidæ.—A sub-family of coleopterous insects belonging to the family *Carabidæ*, and containing a vast number of species. Comparatively few of these beetles are ornamented with metallic colours, the majority being of black or obscure tints, whence they have obtained in some parts of this country, where they are common, the name of imps. They appear to be much infested with the parasitic hair worm or *Gordius*. They are generally found under stones, and about 500 species are enumerated.

Harpyia.—A genus of falcons. See FALCONIDÆ.

Harringtonite.—A mineral substance found in the north of Ireland, occurring mixed with carbonate of lime. Its specific gravity is 2·217. It appears in snow-white crystalline or earthy masses, and consists of silica, alumina, lime, soda or potash, and oxide of iron.

Hartite.—A mineral substance found in the coal of Oberhart, in Austria. Its specific gravity is 1·046, and it is composed of carbon and hydrogen. It is a resinous substance, white, with a fatty lustre, soluble in alcohol and ether, and distils without decomposition.

Hasseltia. — A genus of dicotyledonous plants belonging to the nat. ord. *Apocynaceæ*, and containing a species, *H. arborea*, which is a handsome tree found in Java. It has large yellowish-white flowers, and the trunk yields by incision a quantity of milk, which, mixed with honey, and reduced with boiling water, is employed as a powerful drastic purgative for destroying the tape worm; its use, however, is unsafe.

Hatchettine. *Mineral Tallow.*—A yellowish-white combustible substance, occurring in small translucid masses of a pearly lustre, soft as wax, and when heated giving out a smell like fat. Its specific gravity is ·8035 to ·983. It is fusible in warm water, soluble in ether, and gives out by distillation a bituminous odour, and an oily matter with a residue of carbon. Its composition is carbon and hydrogen. Hatchettine is found on the coast of Finland, at Strasburg, Inverary and Oban, in Scotland, and in the argillaceous ironstone at Merthyr Tydvil, in South Wales. A greenish-yellow substance, apparently belonging to this kind of mineral, is found in the trap rocks near Glasgow, and used by the country people as a balsam for wounds.

Hausmannite. *Red Oxide of Manganese, Black Oxide of Manganese.*—An ore of manganese occurring in porphyry at Ilmeneau in Thuringia, at Framont, and in Pennsylvania, &c. Its specific gravity is 4·722, and it is found in brownish-black masses and in octohedrons. It is composed of manganese, oxygen, silica, barytes, and water.

Hauyne.—A mineral substance named after the celebrated mineralogist Hauy, and found in small crystals in volcanic rocks, as at Andernach, at Albano, and Marino, and in the lava of Vesuvius. It is a glassy substance, of a bluish-green colour, and with an irregular conchoidal fracture. Its specific gravity is 2·45, and it is composed of silica, alumina, potash, lime, sulphuric acid, oxide of iron, and water.

Hebradendron.—A genus of dicotyledonous plants belonging to the nat. ord. *Clusiaceæ*, and containing amongst other species *H. Cambogioides*, the tree which produces the Ceylon gamboge of commerce. See CLUSIACEÆ.

Hectacotylus (ἑκατον, a hundred; κοτυλη, sucker).—A singular worm-like creature, first

found on the animal of the argonaut, and afterwards on several of the cephalopods. It resembles in appearance the arm of a cuttle-fish, and its under surface is bordered with forty or fifty pairs of alternate suckers. These animals, when first discovered, were considered to be parasitic worms belonging to the *Annelida*, but they are now clearly understood to be the males of the species of cephalopods upon which they are found.

Hedenbergite. *Bihydrous Bisesquisilicate of Iron.*—A mineral substance allied to black pyroxene, occurring in greenish-black masses, and found near Tunaberg, in Sweden. Its specific gravity is 3·154, and it is composed of silica, oxide of iron, water, protoxide of manganese, lime, alumina, and carbonic acid.

Hedera.—A genus of plants containing amongst other species the common ivy, *H. helix*. See ARALIACEÆ.

Hedychrum.—A genus of insects belonging to the order *Hymenoptera*, and family *Chrysididæ*, and consisting of small flies of a metallic lustre, and red, blue, green, or violet colours. They are all European species, and the female deposits her eggs in the nests of other hymenoptera, as bees, &c. She makes her entrance to these nests backwards, and after depositing her ova leaves them to be hatched by the warmth of the nest.

Hedyphane.—A mineral substance composed of oxide of lead, lime, chlorine, oxide of arsenic, and phosphorus. It is found in white amorphous masses at Longbanshytton in Sweden, and its specific gravity is 5·46. It is an arseniophosphate of lead.

Hedysarum.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, the species of which are herbs or undershrubs, with unequally pinnate leaves, axillary, with simple peduncles, and bearing racemose spikes of large, purple, white, or cream coloured flowers. Several species, as the French honeysuckle, *H. coronarium*, a native of Spain and Italy, and *H. fruticosum*, a native of Siberia, are used for feeding cattle, horses and mules eating them with avidity. Several other species possess tonic stomachic qualities.

Helamys (ἑλη, heat of the sun; μῦς, rat).—A genus of animals allied to the jerboas. See DIPUS.

Helianthemum. *The Rock Rose.*—A genus of dicotyledonous plants belonging to the nat. ord. *Cistaceæ*. The common rock rose, *H. vulgare*, is a pretty English species, and is peculiar for the irritability of its stamens. If touched in the sunshine, they spread slowly and lie down on the petals.

Helianthus (ἥλιος, the sun; ἀνθος, a flower). *The Sunflower.*—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, suborder *Corymbiferæ*, and deriving its name from the popular supposition that its large heads of flowers follow the sun in its course. The species are herbaceous, rarely shrubby, almost always rough to the touch, and have large yellow flowers. They are chiefly natives of America. The common sunflower, *H. annuus*, was originally a native of Peru, but is now so commonly cultivated in gardens that it has almost become naturalized in Europe. It is a handsome showy plant, rising to the height of upwards of six feet, and having large yellow flowers six or seven inches in diameter. The seeds contain a bland oil, and when roasted they have been used as a substitute for coffee. *H. tuberosus*, the topinambour, Jerusalem, or (more correctly) girasole artichoke, was a native of Brazil originally, but is now cultivated extensively in Europe for its roots, which are tuberous, and are used as a substitute for potatoes. The stem rises to the height of five or six feet, and the leaves are rough to the touch, like the preceding. The Jerusalem artichoke is easily cultivated, grows abundantly, and when once introduced is difficult to be rooted out. The tubers resist frost, and on the continent they are much used as food for sheep. The leaves are eaten by cattle, and the stems are used for fuel.

Helichrysum.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and closely allied to the genus GNAPHALIUM. This genus contains several species, some of which are European, but the majority inhabit the southern extremity of Africa. The involucres having various colours, which they retain after being dried, cause them to receive the name of *Immortelles*, or everlastings, and, if collected fresh, the colours will keep for several years. The common everlasting, *H. orientale*, is a native of Crete, has yellow involucres, and is now cultivated to a considerable extent for the sake of its flowers, which are used for making crowns, garlands, and bouquets. *H. fœtidum*, commonly called "stinking everlasting," grows at the Cape of Good Hope, and its involucres are of a silvery-white; while *H. grandiflorum*, also a native of the Cape, has pale yellow involucres, and is cultivated in our gardens.

Helicidæ. *The Land Snails.*—By the term *Helicidæ* is generally understood a large family of gasteropodous mollusca, living on the land and breathing air by means of lungs. Our knowledge of the species belonging to this family has increased of late years so much, that to understand them properly, it has become necessary to divide and subdivide them into many sub-families and numerous genera. They have indeed assumed the rank of an order amongst the gasteropods, under the name of *Pulmonata* or *Pulmonifera*, and the name *Helicidæ* has been restricted to those genera that have a well developed external shell. The family *Helicidæ*, as thus restricted, may be characterized as follows:—animals respiring free air in a closed chamber lined with pulmonic vessels, usually placed on the front of the back of the animal, and covered by the shell, and having an opening closed by a valve on the

side. They are hermaphrodite with reciprocal impregnation. The larvæ, or newly hatched animals, are shell-bearing, are shaped like the parent, and have no cephalic fins. They have no operculum, but the aperture of the shell is closed during hybernation by a secretion from the collar of the mantle, which soon after it is poured out hardens, and is known by the name of the epiphragm. The teeth of the animal are numerous, and placed in many cross series on the lingual membrane; head furnished with four retractile tentacula, the two upper the largest, and possessing eyes at the apex. The whole body is very glutinous. The shells are various in form, are always external and capable of containing the entire animal. The helicidæ are widely diffused over the whole surface of the earth, ranging northwards as far as the limit of trees, and southwards to Terra del Fuego—abounding in hot and moist plains, and ascending mountains as high as 11,000 feet. Upwards of 1,200 species have been described; some of them are injurious to the agriculturist, and from their voracity are great pests to the horticulturist, others are useful to man as food. The genus *Helix* is the type of the family, and contains several well known species, as *H. pomatia*, the Roman snail, a fine large shell, the animal of which is used as food in many parts of Europe during Lent, and which is recommended along with milk to patients labouring under consumption; *H. aspersa*, the common garden snail, which has been carried abroad and now become naturalized in the most distant colonies. This species is also used in cases of diseases of the chest; they are prepared by being boiled in milk, and are sold in our markets for that purpose. The species of this family are extremely tenacious of life, and many instances of their power to resist drought are on record. A specimen of *Helix desertorum*, the snail of the desert, from Egypt, remained dormant in the British Museum for *four* years; it afterwards lived in my possession for upwards of two years.

Helicina (diminutive of *helix*).—A genus of phaneropneumonous gasteropodous *Mollusca*, belonging to the family *Cyclostomidæ*. They inhabit dry land, breathe air, and are furnished with an annular, not spiral, operculum, which is either shelly or membranous. The species are numerous, very beautiful, and by far the greater number natives of Jamaica and other West Indian islands.

Helicoceras (ἕλιξ, spiral; κέρας, a horn).—A genus of fossil cephalopodous mollusca. See AMMONITIDÆ.

Heliconia.—See HELICONIDÆ and MUSACEÆ.

Heliconidæ.—A family of diurnal lepidopterous insects, containing numerous species, characterized by having short palpi, a slender abdomen, and narrow oblong wings. The caterpillars are cylindrical, and spiny throughout their whole length. They suspend themselves perpendicularly from trees, and in that position change into their chrysalis form. The species of the genus *Heliconia* are butterflies of a very elegant form and varied colours, and are chiefly found in the warm parts of America, especially Guiana and Brazil.

Heliocopris.—A genus of lamellicorn pentamerous *Coleoptera* belonging to the family *Scarabeidæ*, and containing several species of beetles, which are of considerable size and brilliant colours. One species, *H. Isidis*, is frequently represented on the obelisks and tombs of the Pharaohs in Egypt.

Heliotropium (ἥλιος, the sun; τρέπω, to turn). *The Heliotrope.*—A genus of dicotyledonous plants belonging to the nat. ord. *Boraginaceæ*, and containing a number of species, which are herbs or under-shrubs, growing throughout the intertropical zone of both continents, a few being also European. Their leaves are generally rough, and the flowers are small, blue or white, and disposed in circinate spikes. *H. Peruvianum*, Peruvian heliotrope or turnsole, a native of Peru, is a shrub of considerable size, and is now cultivated all over Europe. Its cylindrical branches are covered with tolerably long hairs, the leaves are entire and wrinkled, and its flowers are white or violet coloured, and exhale a very pleasant scent resembling that of vanilla or cherry pie. It is a favourite plant in our gardens, and several varieties are cultivated. Upwards of eighty species have been enumerated; many possess a very sweet scent, and several are consumed in large quantities by perfumers for the sake of their volatile oil.

Helix (ἕλιξ, a spiral).—A genus of land shells. See HELICIDÆ.

Helleborus.—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*. The species are herbs which live in the temperate regions of the Old World. Their flowers, which are large, green, white, or purple, are generally developed in winter or in the beginning of spring. One of the most remarkable species is *H. orientalis*, which has a stem upwards of a foot in height, and is branched only at the top. It has large flowers, with oval coloured sepals. It grows in the dry regions of the East, especially on the shores of the Black Sea, and on Mount Olympus. This plant was known to the ancients, and considered by them a specific in diseases of the mind. Its effects are acrid and violently purgative. *H. niger*, or Christmas rose, has a short and thick root, and several glabrous and long petioled radical leaves, and terminal white flowers. These making their appearance in winter give rise to its English name. *H. fœtidus*, common in waste grounds in the more western parts of Europe, is acrid, possesses powerful purgative qualities, and has been strongly recommended as a remedy against the large round worm, *Ascaris lumbricoides*.

Helopidæ.—A family of insects belonging to the heteromerous *Coleoptera*, and containing a number of species, the larvæ of which live in rotten wood, upon which they feed. The beetles themselves are found also in rotten wood, or under the bark of trees. The genus *Helops*, which gives its name to the family, contains upwards of sixty species, several of which are found in England.

Helops.—See HELOPIDÆ.

Helvine.—A mineral substance found at Schwarzenburg in Saxony. It is very rare, and remarkable for its chemical composition, and its crystalline form. Its specific gravity is 3·166, and it is hard enough to scratch glass. It is composed of protoxide of manganese, sulphuret of manganese, glucine, silica, and oxide of iron; and occurs in tetrahedral crystals.

Hemerobiidæ (ἥμερα, day; βιόω, to live).—A family of insects belonging to the order *Neuroptera*, and termed "aphis lions" by some entomologists. The species are small or of moderate size, and appear to be inhabitants chiefly of temperate climates. They have a small head, with prominent rounded brilliant eyes, which, during life, resemble polished gold, and large wings, deflexed at the sides of the body during rest, much reticulated, and reflecting the prismatic colours. They are sluggish in their motions, fly during twilight, and when handled emit a disagreeable odour. The females deposit their eggs upon plants, attaching them by means of a long and slender footstalk, which gives them the look of a vegetable, and has caused them indeed to be described as a fungus. The larvæ live amongst aphides, upon which they feed, and being very voracious, are serviceable to the agriculturist. Before they change into pupæ, they spin a round silky cocoon, in which they remain for fifteen days. The family originally consisted of the single genus *Hemerobius*, but of late the genus has been divided into several. The typical species of the family is *Chrysopa* (*Hemerobius*) *perla*, an insect of a yellowish-green colour, with diaphanous wings, and eyes of a sparkling golden-green.

Hemerobius.—See HEMEROBIIDÆ.

Hemerocallis (ἥμερα, day; καλός, beautiful). *Day Lilies.*—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, and containing a number of species remarkable for the size and beauty of their flowers. They are natives of Western Europe, and the middle parts of Asia, and several species are cultivated as ornaments to our gardens. *H. flava* has numerous narrow long leaves, from the midst of which rises one or two naked stems a foot and a-half high, branching at the summit, and giving out two or three large nearly sessile flowers, of a clear yellow colour, and possessing an agreeable smell. It grows spontaneously in the woods and moist parts of the mountains of Switzerland, Piedmont, and Hungary, &c., and is cultivated under several different names. Several other species, European and Asiatic, have found a place in our gardens.

Hemicardium.—A genus of cockles. See CARDIIDÆ.

Hemidactylus.—A genus of saurian reptiles. See GECKOTIDÆ.

Hemidesmus.—A genus of plants. See ASCLEPIADACEÆ.

Hemimeles (ἥμισυς, half; μέλος, a limb).—A genus of monsters. See ECTROMELII.

Hemiptera (ἥμισυς, half; πτερον, a wing).—An order of insects, called by some entomologists HETEROPTERA. They are characterized by having four wings, the anterior pair of which are larger than the posterior, lapping partly over each other, the basal portion being coriaceous and resembling elytra, and the apical part being membranous. Their mouth is constructed for suction entirely, and the greater part live on the juices of plants, though many of them, as the bug, suck the blood of other animals. The metamorphosis which the young undergo is incomplete, the larvæ being only distinguished from the adult by the want of any appearance of wings. They change their skin several times in their course to maturity, and it is not till after the third or fourth month that they obtain wings. One curious part of the internal structure of the perfect insect consists in their having a salivary apparatus highly developed, and thus when a hemipterous insect attacks an animal or vegetable with its sucker, it throws out a small quantity of salivary fluid, which being of an exciting nature, produces an increased flow of the fluids to the part attacked, and produces for instance the pain and irritation caused by the bites of bugs, &c. The number of species is very great, the majority being found in tropical countries, and adorned with beautiful varied colours and markings, often as rich as the most splendid of beetles. Some live on land, while others exist only in the water. Most of the terrestrial species emit when suddenly alarmed or handled, a peculiar odour, more or less disgusting, and which is so well known in the case of the bed bug. The insects of this order have been arranged in two large sections, the water bugs, or *Hydrocorisa*; and the land bugs, *Geocorisa* or *Aurocorisa*. To the former belong the families NEPIDÆ and NOTONECTIDÆ; to the latter the families HYDROMETRIDÆ, REDUVIIDÆ, CIMICIDÆ, &c.

Hepatica.—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*, and containing only one species, which is herbaceous, and grows in the northern regions of Europe and America. *H. triloba*ta, the common hepatica, called in France "herbe de la trinité," is well known as one of our favourite garden plants, the flowers of which make their appearance in spring before the leaves.

Hepaticæ. *Liver Worts.*—A nat. ord. of acotyledonous plants. See ACROGENÆ.

Hepatite.—An impure variety of sulphate of barytes, distinguished by emitting when rubbed a disagreeable smell.

Hepialidæ.—A family of insects belonging to the nocturnal *Lepidoptera*, distinguished by having deflexed long and narrow wings, a slender abdomen, and a long and velvety thorax. The caterpillars of these moths live under ground, are nearly smooth, and feed upon the roots of plants. When full grown they bury themselves in the substance of these roots, and form cocoons, covered externally with small fragments of earth, and lined internally with fine silk. The genus *Hepialus* is the type of the family, and contains about a dozen species, all of which are natives of Europe. Several of them are found in this country, one of which is known by the name of the ghost moth, *H. humuli*. The caterpillars feed upon the hop plants, and sometimes cause great destruction to that crop. A large species, *H. virescens*, is found in New Zealand, and its caterpillar is frequently attacked by a species of fungus, *Sphæria Robertsi*, which ultimately converts the whole body of the insect into a vegetable substance.

Hepialus.—See HEPIALIDÆ.

Heracleum.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, containing several species, one of which is common in Great Britain and other parts of Europe. This plant, *H. sphondylium*, is commonly known by the name of cow parsnip or hog-weed, and is considered a nourishing food for cattle and pigs. Horses and rabbits are also fond of it, and the natives of Kamtschatka and Russia use the shoots and leaf stalks as food, after the rind, which is bitter, has been removed. The Russians also distil a fermented spirit from the stalks when dried, which during this process become covered with a saccharine efflorescence.

Herminia.—A genus of insects belonging to the nocturnal *Lepidoptera*, and forming in Latreille's method the chief part of the family PYRALIDÆ.

Hernandia.—A genus of dicotyledonous plants forming the type of the nat. ord. *Hernandiaceæ* according to some botanists, or the family *Hernandieæ*, a sub-order of the *Thymeleaceæ* or daphne family, according to others. The species are natives of various parts of the East and West Indies, and the genus derives its name from Hernandez, a naturalist sent out to Mexico by Philip II. of Spain. The name is said to have been applied to these plants because they have large leaves and little flowers, in allusion to the great opportunities afforded to this naturalist, and the little use he made of them. One of the most remarkable species of the genus is *H. sonora*, a tall erect tree, with cordate peltate leaves, yellowish flowers, and a large inflated succulent calyx. The specific name was given to it from the noise made by the wind whistling through its persistent involucels. The bark, the seed, and the young leaves are slightly cathartic, and the juice of the leaves is said to be an effectual depilatory, destroying the hair wherever it is applied, and this without producing pain.

Herodias.—A genus of herons. See ARDEIDÆ.

Herpestes.—A genus of animals belonging to the class *Mammalia*, order *Feræ*, family *Felidæ*, and sub-family *Viverrinæ*, or civets. Several species have been described, natives of Africa and Asia, but the best known and most typical is the ichneumon, *H. Ichneumon*, a native of Egypt, and well known to the ancients. This animal is of an elongated form, about eighteen inches long, with fur of a chestnut-brown and yellow colour, feet and muzzle black or deep chestnut, and has a long tail, strong at its base and terminated by a tuft of long hairs. The legs are short, its eyes small and glowing, and its muzzle is pointed. In ancient Egypt the ichneumon was reckoned one of its sacred animals, and in more modern times has been the subject of many wonderful tales. It is found in Upper and Lower Egypt, living during the inundation of the Nile in gardens and near villages, but in the dry season dwelling in fields and near the river. It feeds upon rats, birds, and reptiles, and is especially fond of eggs. In Upper Egypt the ichneumons are said to be particularly serviceable to man, by searching in the sand for the eggs of the crocodile, and devouring them in great numbers — by which means the increase of these dangerous animals is considerably checked. They are said to be easily tamed. The species here figured, *H. griseus*, is an Indian species, of similar habits, but of a grayish colour

Herpestes griseus—Indian Ichneumon.

Hieracidea.—A genus of hawks. See ACCIPITRINÆ.

Hersilia.—A genus of coleopterous insects, natives of Brazil. Also a genus of spiders belonging to the family *Araneidæ*, two or three species of which are known, one a native of Egypt and two others of Asia. Also a genus of entomostracous *Crustacea*, belonging to the family *Pontiidæ*, and found in the Mediterranean.

Hesperia.—See HESPERIDÆ.

Hesperidæ.—A family of insects belonging to the diurnal *Lepidoptera*, and commonly known by the name of *Skippers*. They are characterized by having their antennæ terminated by a thick club, and occasionally strongly hooked at the tip, their hind tibiæ provided with spurs, the wings generally short, and occasionally the hind ones furnished with long tails. The caterpillars (of which only a few are known) are cylindrical, without spines, with a robust globular head, and the anterior segments narrowed. They live upon the leaves of plants, which they roll up, and in which they construct a slender silken cocoon, wherein they undergo their transformations. The flight of the perfect insects is very strong and peculiar, short and jerking, whence their English name. The genus *Hesperia*, which gives its name to the family, has several species, which differ from the generality of butterflies by only raising their upper wings when in a state of repose, the lower ones being retained horizontally. The greater number of the species are of a fawn colour, with black lines or spots.

Heteralæi (ἕτερος, different; ἀλως or ἀλωη, place).—A family of double parasitic monsters, characterized by the insertion of a very incomplete parasitic individual upon one of the extremities of the body of an otherwise perfect individual. One of the most common cases of this kind of monstrosity is, when upon the head of an individual in other respects regularly formed, an accessory head is attached, complete in itself, but having only an imperfect neck and some rudiments of a trunk. These two heads generally adhere by their vertex, and this particular genus has received the name of *Epicomus*. Three cases are related as having occurred in the human species. One of these occurred in India, the child being born in Bengal in 1783. The midwife who presided upon the occasion was so horrified at the sight of the monster that she hastily threw it into the fire. It was rescued, however, by some of those present, and though somewhat injured, lived till it was four years old. It only then died through the accidental bite of a venomous snake. During life, the accessory head showed only feeble signs of life, but still it partook of a general sympathy with the other. When the mouth of the perfect child was applied to the breast, the lips of the accessory head moved in sympathy; and when the perfect child laughed or cried, the features of the parasitic head seemed to participate to a certain extent in the emotions.

Heterocera (ἕτερος, dissimilar; κερας, horn or antenna).—A section of lepidopterous insects, adopted by modern entomologists to contain those species which Linnæus arranged under the genera *Phalæna* and *Sphynx*, and corresponding to the nocturnal and crepuscular lepidoptera of other authors. It obtains its name from the diversified formation of the antennæ, which are never terminated by a club, as in the butterflies, but are generally setaceous, filiform, or fusiform. All the insects known by the name of moths, the old genus *Phalæna* of Linnæus, belong to this division.

Heteromera (ἕτερος, dissimilar; μερος, part).—A name given to one of the four sections into which the order *Coleoptera* is divided. It contains those beetles which have five joints in the tarsus of the first and second pairs of legs, and only four in the tarsus of the third pair. They are almost all vegetable feeders.

Heteromys (ἕτερος, dissimilar; μῦς, a rat).—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, family *Muridæ*, and sub-family *Saccomyna*. Only one species is known, *H. anomalus*, the spiny-pouched rat, which is about the size of the common rat. It has four grinding teeth in each jaw, and it possesses cheek pouches, in which it amasses provisions, as do the hamsters. These pouches are formed of a doubling of the common integuments, and are clothed internally with scattered hairs, somewhat like the abdominal pouch of the opossums. The body is partly covered with flat channelled spines, like those of the echimys. It is of a chestnut-brown colour on the back, with the neck, belly, and legs white; has the habits of the rat, and is a native of the island of Trinidad.

Heteroptera (ἕτερος, dissimilar; πτερον, a wing).—An order of insects which derives its name from the anterior pair of wings having the basal portion coriaceous, and the apical part membranous. It is synonymous with HEMIPTERA.

Heterotypi (ἕτερος, different; τυπος, a type).—A remarkable family of double monsters, belonging to the parasitic order, and characterized by the union of two individuals anteriorly, one generally of a normal development and form, the other imperfectly developed and parasitic—in other words, it consists of a fœtus, appended to the front of another well formed individual, who lives both for itself and its brother. The two individuals are very different in size as well as development, the parasitic individual being a kind of appendage more or less inert, and more or less incomplete. Sometimes they are double inferiorly, simple superiorly; at others they are double superiorly, simple inferiorly; whilst at other times, again, they are double both superiorly and inferiorly. These monstrosities occur in the human race as well as in lower animals. The first kind are arranged under the genus *Heteropages*. One case is related which lived to an adult

age; and when seen wrapped up in a cloak, nobody could perceive anything monstrous in his appearance. The second kind belong to the genus *Heterodymus*, a case of which occurred in a child born in the island of Java, and which lived for some weeks. The third kind are placed in the genus *Heteradelphus*, one case of which is related as occurring in Touraine, in 1826, the child living for twelve months; and another at Macao, in China, which lived in good health to an adult age.

Heulandite. *Foliated Zeolite.*—A mineral occurring in Scotland, Ireland, Iceland, the Faroe Islands, in Bombay, &c., usually lining cavities in trap rocks. It is obtained in snow-white or flesh-red right oblique prisms, or massive in round balls. It has a vitreous and pearly lustre, is translucent and brittle, and is composed of silica, alumina, lime, and water. Its specific gravity is 2·195.

Hexaprotodon.—A genus of fossil *Hippopotami*. See HIPPOPOTAMUS.

Hiatella.—A genus of shells. The immature state of SAXICAVA.

Hibbertia.—A genus of plants. See DILLENIACEÆ.

Hibernia (*hibernus*, winter).—A genus of nocturnal *Lepidoptera* belonging to the family *Geometridæ*, and so named because the species only make their appearance in the perfect state at the end of autumn or even in the middle of winter. The females are remarkable for having no wings, or at least only rudimentary ones. Their caterpillars bury themselves at the feet of trees, in order to change into the chrysalis form. One of the best known species is *H. defoliaria*; and the caterpillars are in some years very destructive to fruit-trees, upon which they feed. The best method of preventing injury to these trees is to surround the trunk of the tree with a circle of glue, or some sticky substance, in the months of November and February, at both of which times the insects come out in the perfect state from the ground at the foot of the tree. The females, having no wings, are obliged to crawl up the tree, and are arrested in their progress by this circle of glue, before they can lay their eggs. One female lays about 300 eggs.

Hibiscus.—A genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*, and forming the type of the sub-order *Hibisceæ*. The species are principally herbaceous, and the greater number are natives of the hot parts of Asia and America. Some of them are of large size, and are very ornamental plants; and they are generally remarkable for abounding in mucilage, which renders some of the species useful as articles of diet, and for the tenacity of the fibre of their bark, which renders many of them of great importance in rope-making. The fibre known in India as sun-hemp is the produce of *H. cannabinus*, which is cultivated everywhere in India for this purpose. Upwards of one hundred species are known.

Hinnites.—A genus of bivalve shells belonging to the family *Spondylidæ*. Originally formed upon a fossil shell, the genus at first contained only extinct species. The living type, however, has been found in a shell long known and described as a species of pecten, and a common shell on the coasts of Great Britain. The chief character of the genus is, that though when young the shell is regular and byssiferous, it afterwards cements its lower valve to other shells or stones, &c., and becomes more or less irregular in form. The living species, *H. pusio*, is the *Pecten irregularis* of former conchologists, and is found throughout the European seas. Two or three other recent species have been described, and several occur fossil in the tertiary formations.

Hipparchia.—A genus of diurnal *Lepidoptera* belonging to the family *Nymphalidæ*, and containing a number of species, which are chiefly natives of temperate regions. Several are British, amongst which is the marbled white butterfly, *H. Galathea*, a common insect, of a yellowish-white colour, chequered with black, and frequenting moist meadows. The caterpillar feeds on grass. The meadow brown butterfly, *H. Janira*, one of the most common of all the butterflies, occurring in every meadow or lane in Britain in the month of July, is of a dull dark brown colour, the anterior wings marked with a black ocellus, with a white pupil. The caterpillar is green, and feeds upon meadow grass.

Hippobosca.—See HIPPOBOSCIDÆ.

Hippoboscidæ (*ἵππος*, horse; *βοσκω*, to feed upon).—A family of insects belonging to the order *Diptera*, and section *Pupipara*, and containing a number of species, which are very troublesome to horses, cattle, and even birds, &c. They are of small size, are covered with bristles, run with great agility upon the bodies of the animals upon which they reside, often sideways, and bury themselves amongst the hair or feathers. The species of the genus *Hippobosca* are flies of an oval, flattish form, and are covered with a tough leathery skin. The abdomen is covered with a continuous membrane without distinct rings, and susceptible of great dilatation—a structure necessary in the female from the peculiar manner in which she brings forth her progeny. Instead of laying eggs, as other insects do, she retains them within her body till they are hatched. The larvæ live in that situation till they reach their full size, and assume their pupa state, which is in the form of an egg, nearly as large as the abdomen of the mother. Upon expelling this pupa case, it quickly becomes hard, and suddenly enlarges to a greater size than the abdomen itself in which it was contained. The larger end has a sort of hood, which the insect scales off as soon as it is ready to make its escape. The species which attacks the horse, *H. equina*, is extremely common, and attaches itself to the belly of its victim, between the hind thighs and under the tail—parts less protected by hair. Five species have

been described, which, however, are perhaps mere varieties of the *equina*, and which are said to have been introduced into the various countries where the horse has been domesticated. One of them is found upon the camel in Egypt, *H. camelina*, and another at the Cape of Good Hope upon the quagga and upon the ostrich. Several species are found upon birds, one especially, *Craterina hirundinis*, depositing its egg in the nest of the swallow, where it receives all the necessary warmth, for which it repays the poor swallow by sucking its blood.

Hippobroma (ἵππος, a horse; βρωμα, food).—A genus of dicotyledonous plants belonging to the nat. ord. *Lobeliaceæ*, and containing only one species, *H. longiflora*. This is an herbaceous plant, a native of the West Indies, and is exceedingly poisonous, the juice, if it only accidentally touch the lips or eyes, producing a severe degree of inflammation. Horses are violently purged after eating it.

Hippocampus. *Sea Horse.*—A genus of fishes. See SYNGNATHIDÆ.

Hippocastaneæ. *Horse Chestnuts.*—A sub-order of dicotyledonous plants, forming part of the nat. ord. *Sapindaceæ*, and containing the horse chestnuts. The species are all considerable sized trees, and are remarkable for the beauty of their flowers and leaves. The common horse chestnut, *Æsculus hippocastanum*, is the best known species. It is a handsome tree, and its pyramidal spikes of white flowers, variegated near the centre with yellow or red, which appear in May, intermixed with the large, digitate leaves, exhibit a noble appearance when seen in large clumps or long avenues, such as the avenue at Bushy Park. Its native country is not well known, but it was introduced from the Levant to this country about the year 1683. The horse chestnut is a tree of quick growth, but the wood is soft and spongy. Deer are fond of the fruit; and in Turkey the nuts are ground and mixed with the provender for their horses, especially those which are broken winded; hence perhaps the English name. Starch is yielded in considerable quantity from the nuts; and when deprived of its bitterness by maceration in weak ley, is recommended as a very nutritious food for horses, goats, oxen, and sheep. The horse chestnut contains an astringent, saponaceous juice, which, obtained by peeling the nuts, and grinding or rasping them, has been used in France and Switzerland for bleaching yarn. A species with scarlet flowers, *Æsculus carnea*, is grown in this country, and forms a beautiful and ornamental tree for the pleasure ground.

Hippocratea, Hippocrateaceæ.—A nat. ord. and genus of dicotyledonous plants, named after Hippocrates, and comprising a number of species, which are trees or climbing shrubs, growing in the tropical parts of America, Africa, and the East Indies. The fruit of several is edible, the seeds of *H. comosa* being eaten in the West Indies as almonds; but they are of no utility otherwise.

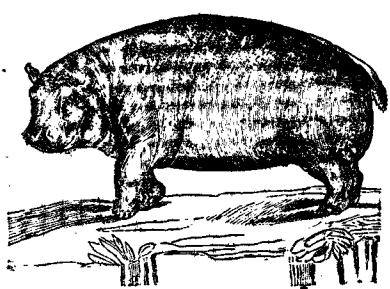
Hippoglossus.—A genus of malacopterygious fishes belonging to the family *Pleuronectidæ*. In this genus the two eyes are on the right side. The best known species is the holibut or halibut, *H. vulgaris*, a well known fish, a native of the seas of Great Britain, and frequently seen in our markets. In Scotland it is often called the turbot. Its flesh is rather coarse and dry but well flavoured. It attains a large size, being frequently six or seven feet long and weighing 300 or 400 lbs. In the northern seas specimens have been taken 500 lbs. weight and eighteen feet in length. In Greenland the transparent membrane of the stomach is used instead of plates of glass.

Hippomane (ἵππος, a horse; μαινω, to put in a rage).—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and comprising amongst several other species the famous manchineel tree, *H. Mançanilla*. This tree is a native of the West Indies, and is considered extremely poisonous. It indeed possesses as bad a reputation in the West as the upas tree does in the East. Like the rest of the order, the whole tree abounds in a milky juice, which is exceedingly acrid. Dropped on the skin it produces in most people severe inflammation, and even ulceration, and the fruit when eaten produces the same effects on the mouth. In some places it forms thick woods, and no other vegetation will grow under its branches. It is said to be dangerous to sleep under the manchineel, and the land crabs which at times are found poisonous when eaten, are asserted to derive their deleterious qualities from this tree. This latter assertion may be doubted, but it appears certain that if rain or dew pass through the branches, and fall upon any one underneath, the drops will produce severe inflammation of the skin wherever touched. The fruit resembles a small apple, and the tree derives its specific and English name from the Spanish word *Manzanilla*, a little apple. These trees have now become scarce, as the natives destroy as many as they can. When they wish to cut a tree down, they light a fire under it so as to destroy the bark, and thus prevent accidents from the juice falling upon their hands and faces.

Hipponyx (ἵππος, a horse; ονυξ, a hoof).—A genus of shells belonging to the class *Gasteropoda*, and family *Capulidæ*. This genus was originally formed upon a fossil species which was found adherent by a calcareous support to other shells or rocks, and which bore upon it a profound impression in the form of a horse-shoe. Living examples were afterwards found in various parts of the world, which showed the same shelly base, and a similar horse-shoe impression produced by the adductor muscle. At first they were considered bivalve shells, but now they are proved to be closely allied to the genera *Capulus* and *Calyptræa*.

Hippophae.—A genus of plants. See ELÆAGNACEÆ.

Hippopotamus (ἵππος, a horse; ποταμός, a river).—*The River Horse.* A genus of pachydermatous animals belonging to the class *Mammalia*, order *Ungulata*, family *Elephantidæ*, and forming the type, and as yet only genus, of a small sub-family, *Hippopotamina*. The hippopotamus has thirty-eight teeth; four incisors above and below; two canines above and below, which are, in fact, enormous tusks, sharpened into a somewhat chisel-like edge; fourteen molars above and twelve below, the enamel of the crowns of which when they are old and worn assume the form of trefoils. The body is very large, the legs short, and the skin is nearly destitute of hair. It has a short tail and a large tumid muzzle. The feet are terminated by small hoofs, and the female possesses two ventral mammæ. It is a native of Africa, being found at the Cape of Good Hope, in Guinea, the Congo, and Senegal; over all the East coast, in Abyssinia, Ethiopia, Nubia, and Upper Egypt. Only one well characterized species exists, though three varieties have been described as distinct species, the Cape variety being described as *Capensis*, the Senegal variety as *Senegalensis*, and the Abyssinian variety as *Abyssinicus*. By Linnæus, however, and the most recent zoological writers, there is only one acknowledged, the *Hippopotamus amphibius*. This animal is of enormous



Hippopotamus.

size, being sometimes eleven feet long and ten feet in circumference; indeed, next to the elephant and rhinoceros, it is the largest quadruped known. Its form is massive, its legs are short and thick, and its belly almost trails the ground. Its head is enormous, and its mouth immensely wide. The canine teeth are sometimes more than a foot long, and weigh upwards of six pounds each, but nevertheless are always concealed within its lips. The ears and eyes are very small. The hippopotamus is heavy and slow in its movements when it walks upon dry land, but it swims and dives with remarkable agility. It can remain for a long time under water without being obliged to come to the surface to breathe, and it is affirmed that it can walk upon the ground at the bottoms of the rivers and ponds where it spends its time, as well as on dry land. It is sufficiently peaceable in its habits unless when pursued, when it turns in its defence and becomes savage and ferocious. These animals live during the whole day in the water, only coming on land at night to seek their food. This consists of aquatic plants and shrubs growing on the banks of the rivers, but it occasionally leaves the water side and enters fields of sugar cane, rice, and millet, where it commits great devastation, for its consumption of food is very great. They live in pairs, and appear to take great care of their young, showing much tenderness and attention to their wants. The flesh is reckoned very good to eat when young, and is much esteemed by the Hottentots and natives of Abyssinia. The chase of the hippopotamus is a great favourite with the natives of the countries where it is found, as the tusks are exceedingly valuable, the ivory being much superior to that of the elephant. It keeps its colour better than any other kind of ivory, and is much used by dentists for making artificial teeth. Great numbers of these teeth are imported to this country, and they usually fetch about thirty shillings a pound. In Egypt and at the Cape of Good Hope, whips are made of the hide, which are much esteemed. When dried, the skin is made into shields, which are said to be bullet proof. Two specimens of this huge unwieldy looking animal are now alive in the Gardens of the Zoological Society, Regent's Park, London. The hippopotamus was known to the ancients, and there is no doubt it is the behemoth of the book of Job. The poetical description of this huge animal in that sacred writing is very accurate, and its habits are noted with great distinctness. "He eateth grass as an ox." Though living chiefly in the water, it comes to the land to feed upon the aquatic plants and shrubs growing on the banks. "He lieth under the shady trees, in the covert of the reed, and fens. The willows of the brook compass him about." It is in such situations that he reposes when he comes on shore, and in which the female brings forth her young. "His bones are as strong pieces of brass; his bones are like bars of iron." This agrees well with his massive form and short, strong, thick legs. If there is only one living species existing at the present day, there is no doubt that several distinct species have existed in former eras of our globe, as no fewer than five have been described. The remains of one of these, *H. major*, have been found in abundance in England. They are all found in the eocene beds of the tertiary formations of Europe, and a representative of the family, described under the generic name of *Hexaprotodon*, from its having six incisive teeth in the lower jaw, has been discovered in the Sewalik hills in India.

Hippopus (ἵππος, horse; πους, foot).—A

genus of bivalve shells belonging to the family *Tridacnidæ*, and called the horse-shoe oyster, and bear's foot clam. The valves, instead of being open anteriorly like *Tridacna*, are closed. The animal spins a byssus. Only two or three species are known, large, handsome, finely coloured shells found on the raised coral reefs of Australia and the South Sea.

Hippuris (*ἵππος*, a horse; *οὐρά*, a tail). *The Mare's Tail.*—A genus of plants. See HALORAGEACEÆ.

Hippuritidæ.—A family of fossil extinct shells belonging to the class *Acephala*, and taking their position near the *Chamidæ*. Long believed to be corals or cephalopods, these curious and puzzling fossils have been the subject of much discussion amongst naturalists. Now, however, they appear to be definitely established as bivalve shells. The species are characteristic of the cretaceous group of rocks, and are found in such abundance in many parts of the Peninsula,

Hippurites bioculatus.

the Alps, and East Europe, that the equivalent of the lower chalk has received the name of hippuritic limestone. The genus *Hippurites* may be taken as the type of the family. The shell is inequivalve, inversely conical, or elongated and cylindrical. The right valve is attached by the umbo, and the left is free and depressed. *H. cornu-vaccinum* attains a large size, being more than a foot long, and is curved like a cow's horn; hence its specific name. Sixteen different species have been described, a figure of one is here represented.

Hircus. *The Goat.*—See CAPREÆ.

Hippuritis.—See HIPPURITIDÆ.

Hirudinidæ. *The Leech family.*—A family of annelides. See ANNELIDA.

Hirundinidæ.—*The Swallow family.* A family of birds belonging to the order *Passeres*, tribe *Fissirostres*, and sub-tribe *Fissirostres diurnæ*. The swallows form a very interesting family of birds, which have attracted the attention of naturalists of all countries, and writers of all ages. In the sacred writings, as in Isaiah, and in the works of Homer, Aristophanes, Virgil, Herodotus, Ovid, &c., &c., frequent allusions are made to the birds of this family. They have been the subject of many strange tales and fabulous stories, but stripped of all their wonderful qualities, they still present a sufficient degree of interest in their habits and economy to render them worthy of great attention. The earliest accounts we have of swallows all agree in representing them as dwelling in places inhabited by man. And though a few species are now known to live in desert places and wild retreats, as some of those which belong to the New World and to the islands of the East, yet it is true at the present day that the greater number are found in the near neighbourhood of man's dwellings, and many prefer as the places for building their nests, the windows and chimneys of our houses. They have been looked upon in most parts of the world as sacred birds, the friends of man, and a very general feeling prevails that it is barbarous and unlucky to kill them or destroy their nests. In Great Britain, France, and America, these kindly feelings still exist, but in Tuscany, according to the accounts of recent naturalists, swallows are regarded as mischievous birds, and are mercilessly doomed to destruction. They feed upon insects, and the immense havoc they make upon these creatures, many of which are hurtful to man, recompenses him in some degree for the protection he affords them. Swallows are social birds. They generally live in large families, build their nests in company, and in flocks follow the insects through the air upon which they feed. They appear to be particularly attached to the places where they build their nests, returning year after year to the same nest to breed. The places where they construct their dwellings are always observed to be lofty and airy, and they prefer the neighbourhood of water, near to which they find the greater part of their food. They are almost always on the wing, the structure of their frames enabling them to fly rapidly, and for a length of time without alighting. In flight they catch their prey; skimming along the surface of the water they eat, drink, and wash, without staying their rapid course; in flight they often feed their young, and it is when on the wing that they collect the

greater portion of the material for constructing their nest. The movements of the swallows in the air are full of grace and beauty, and their swiftness is amazing. It has been calculated that they are able to fly sixty miles in an hour. Their movements on the ground, however, are very different, and they appear to have some difficulty in raising themselves from it when once they alight. Their eyesight is remarkably quick and good, and even excels many of the birds of prey which are so well known to possess this faculty in a high degree. They are asserted to be able to discern as small an object as a female ant on the ground, when hovering 315 feet above it. The nests which they form, and to which so many of them return year after year, vary according to the species. Some attach them to walls, under the eaves of roofs or windows, &c.; others fix them to rocks, vaults, or caverns; while others, again, take possession of old quarries, holes formed in old trees, or excavated by other animals, or hollow out galleries in the soft sand by the water side. The materials of which they construct them vary also according to the species. Those of the chimney swallows are made of soft clay or mud mixed with bits of straw, and lined internally with feathers. The nests of the black martin are composed of bits of twigs, pieces of straw, feathers, &c., agglutinated together by means of a viscid secretion which flows from their mouth, and those of the edible swallow of China are formed of a kind of sea-weed. The males are very attentive to the females when sitting on their eggs, and the parents are excellent examples of affection for their young. Swallows are, for the most part, migratory birds. In this country they take their departure at the end of autumn, and seek out a milder climate for the winter. In spring they return to their old haunts. Their departure takes place in immense flocks, and almost always at the same time, but we find them reappearing in spring in smaller numbers, or only in pairs. Those species which breed in Europe pass the winter in the islands of the Archipelago, and in various parts of Africa. Amongst early naturalists extraordinary tales were told of swallows passing the winter in caves, and even under the surface of the water, at the bottom of ponds! But though those marvellous stories are no longer worthy of credit, many facts are related, apparently on good testimony, which prove that swallows can remain for a length of time, perhaps a whole winter, in a state of torpidity, as some of the mammalia do. Swallows are found in all parts of the world, and upwards of seventy species are known to exist. They all enter into the single genus *Hirundo* of Linnæus, but succeeding authors separated the swifts from the swallows, retaining for the latter the genus *Hirundo*, and referring the swifts to the genus *Cypselus*. These two genera now form the types of two subfamilies, *Hirundinina* and *Cypselina*, and the various species belonging to them are still further divided into several genera. The family *Hirundinidæ* may be distinguished from other passerine birds by their having a short beak, broad at the base, flattened horizontally, and deeply cleft, causing the mouth to be very wide. Their feet are short, the wings very long, and they are diurnal in their habits. The sub-family, *Cypselina*, or swifts, are distinguished from the true swallows, or *Hirundinina*, by their wings being relatively larger, their upper mandible more strongly and suddenly curved at the point, and more particularly by their generally having short, robust toes, close together, nearly equal in length, and armed with strong and curved claws, while the claws of the swallows are weak, and the external toe, claw included, does not extend beyond the last phalanx of the middle toe. Amongst the *Hirundinina* are several very common species. The chimney or house swallow, *Hirundo rustica*, builds its nest about three or four feet from the top of the inside of a chimney, has generally two broods in the year, makes its first appearance in this country in the early part of April, and retires to the south on the approach of winter. For some time before they leave the country, they forsake houses and roost on trees, preferring the dead leafless branches, and within a day or two of retiring, they assemble in vast flocks on house tops, the leads of churches, and on trees, from whence they take their flight in company. The chimney swallow warbles softly but sweetly, and in soft sunny weather sings both perching and flying. The barn swallow, *Hirundo rufa*, is a native of America, and receives its English name from its attaching its nest, which is in the shape of an inverted cone, to the rafters in barns, &c. These birds are easily tamed, and soon become very gentle and familiar. The window swallow or martlet, *Chelidon urbica*, is found throughout Europe and Asia, and is more abundant in England than the chimney swallow. It arrives in general about ten days later, begins to build early in May, and places its nest in the corners of windows, beneath the eaves of a house, or sometimes against rocks and cliffs by the sea side. In the month of October they begin to migrate, continuing to depart till the 6th of November, by which time they have generally all disappeared. The sand martin, or bank swallow, *Cotyle riparia*, is the smallest and least numerous of our swallows, and dwells in communities along steep gravelly banks, in which it makes deep holes for breeding places. It is much more abundant in America, congregating there in immense multitudes. It is the earliest in its arrival in this country of all the swallows, and is a migratory bird in America as well as Europe. The purple martin, *Progne purpurea*, is a native of America, inhabiting all parts of the United States and Canada to Hudson's Bay. It is a general favourite, and takes up its abode among the habitations of men. The Indians and negroes

hang up gourds, properly hollowed, for its convenience; and in some parts of the Union considerable expense is sometimes incurred in preparing for it a suitable residence. Their nests are formed of dry leaves, slender straws, hay, and feathers. In addition to insects, this species feeds much upon berries, especially when in its winter quarters. Wilson tells an amusing story of this bird. He says he never met in the United States more than one man who disliked the martins. "This was a penurious, close-fisted German, who hated them because they, as he said, 'ate his peas.' I told him he must be mistaken, as I never knew an instance of martins eating peas; but he replied with coolness, that he had many times seen them himself 'blaying near his hife, and going schnap, schnap,' by which it was understood that his *bees* had been the sufferers, and the charge could not be denied." Amongst the *Cypselinæ* are some of the largest species of the family. The common swift, or black martin, *Cypselus apus*, is larger, stronger, and its flight is more rapid than that of any other of the family. Its length is nearly eight inches, and its general colour is sooty-black, with a tinge of green. The swift builds its nest in the holes or crevices of high towers or steeples, and, unlike the swallow, has only one brood in the year, and the young do not moult before the second autumn. It flies high, and wheels with a bolder wing than the swallows, with which it never mingles. They arrive in this country about the beginning of May, and depart in August. They are found at the Cape of Good Hope, and probably visit the more remote regions of Asia. The American chimney swallow, *Acanthylis pelasgia*, is a native of the United States, and builds its nest in chimneys. They arrive in spring, about the end of April, or beginning of May, and for a considerable time after associate together every evening in one general rendezvous; those of a whole district roosting together. This place of repose, in the more unsettled parts of the country, is usually a large hollow tree, open at top; and trees of that kind are commonly called swallow-trees. They take their departure in the first or second week in September. The esculent swallow, *Callocalia esculenta* or *nidifica*, is a native of the Indian seas, is particularly abundant in the islands of the Moluco Archipelago, in the islands of Sumatra, and Java, &c., and builds its nest in deep and almost inaccessible caves. This nest is shaped like the common swallow's nest, and is formed of a whitish gelatinous substance, arranged in layers, and obtained by macerating in the stomach a species of fucus or sea-weed. The edible birds' nests of China are far-famed, and in that country are prized as a great luxury. The Chinese consider them as possessed of great restorative powers, and as the collecting of them is hazardous and expensive, they fetch a high price in the market. In Canton the secondary sorts are generally sold for their weight in silver, but the best kind, or that which is taken before the young birds have been hatched, fetch at times about £5 18s. 1½d. per lb. The quantity annually exported from the islands of the Indian Archipelago has been estimated at 242,000 lbs., worth £284,290. *Callocalia brevirostris* is a Cingalese species, which builds in limestone caves at a distance from the sea. Hundreds of nests are to be seen in a cave at Havissay, thirty-five miles inland, glued to the rock, and some of these are very clear, white as snow, and thin. These nests, however, do not seem to be used by the natives of Ceylon.

Histology (ἱστος, a web or tissue; λογος, a discourse).—A term now much in use, and applied to designate the doctrine of the ultimate structure of the parts of plants and animals in relation to their development. The science is founded upon observations made by means of the microscope, and is of, comparatively speaking, recent date. The ultimate composition of organized bodies was unknown to the ancient observers, and the science of histology may be said to have originated with the early microscopic observers, Malpighi and Leeuwenhoek.

Holcus.—A genus of glumaceous monocotyledonous plants belonging to the nat. ord. *Gramineæ*. Several species of these grasses are described, two of which are British. A species, *H. saccharatus*, a native of China, abounds in sugar. The late scarcity of corn (1854) in France, has drawn attention to this plant, which promises to supersede, to a certain extent, the use of beet root in the manufacture of sugar, and the distillation of alcohol. This grass is known by the name of *Sorgho*, and by many botanists is arranged under the genus SORGHUM. It has been used from time immemorial by the inhabitants of China, by whom large quantities of sugar are extracted from it. It is called "the sugar cane of the north of China," and numerous experiments have been lately tried in France, with a view to ascertain its properties. From the report of the Toulon Agricultural Association it appears to be richer in the saccharine principle than any known plant except the vine. While beet root contains from 8 to 10 per cent. of sugar, the sorgho produces from 16 to 20 per cent., from which 8 to 10 per cent. of pure alcohol, fit for all industrial and domestic purposes, can be procured. The refuse is excellent food for cattle, who are very fond of it. The plant grows rapidly, and does not require irrigation.

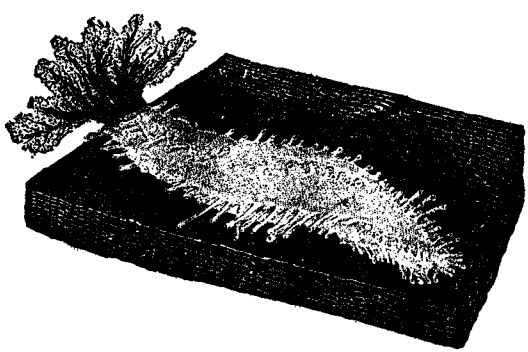
Holocanthus (ὅλος, entire; ακανθα, spine).—A genus of acanthopterygious fishes belonging to the family *Chætodontidæ*. The fishes belonging to this genus are distinguished by the lower part of their operculum ending in a long horizontal spine. About twenty-four species have been described, scattered over the tropical seas of both hemispheres. They are of a compressed flattened form; are the most brilliantly coloured of all the family, and their flesh is considered delicate eating.

Holocentrus (ὅλος, entirely; κεντρον, a

spine).—A genus of acanthopterygious fishes belonging to the family *Percidæ*, and called spring-headed perches. There are about eighteen species known, all of brilliant colours, red, purple, or rose, relieved by polished gold or silver. Their branchiostegous membrane and their fins are covered with spines, and their body is covered with hard, rough, or denticulated scales. In the West Indies the English call them the red men, and the French the cardinals.

Holothuria.—See HOLOTHURIIDÆ.

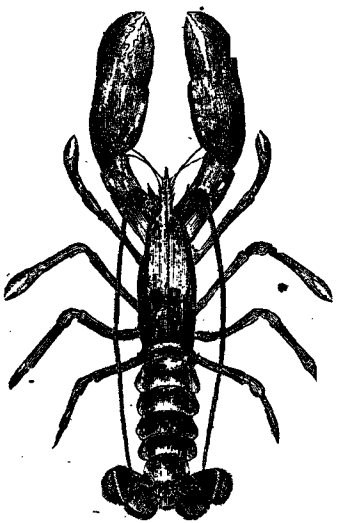
Holothuriidæ (ὅλος, entire; θυείον, small hole). *Sea Cucumbers.*—An order of radiated animals belonging to the class *Echinodermata*, and answering to the genus *Holothuria* of Linnæus. The body of these animals is more or less elongated, sometimes vermiform, soft or flexible in all its parts, very extensile and contractile, and furnished with numerous suckers, by means of which their movements are effected. They have a large orifice at each extremity, at the anterior of which is situate the mouth, placed at the bottom of a kind of funnel, which is supported throughout its whole circumference by a circle of small calcareous fibres, and surrounded with a circle of from five to ten branchial appendages, more or less plumose. The species are numerous, and are arranged in several families, or groups, such as the vermiform holothurians, or SYNAPTIDÆ, the sea cucumbers, or PSOLIDÆ, the siphon cucumbers, or SIPUNCULIDÆ, the true holothurians, or *Holothuriidæ*. These latter containing the genera *Holothuria*, *Trepang*, &c., are found in all seas, generally adhering to rocks near the shore. Some of them reach to nearly the length of two feet, and seven to eight inches in circumference, and many are useful to man as articles of food. In China many different species are collected and sold for this purpose, under the general name of beche-de-mar, sea slugs, or trepang; and are much esteemed by the Chinese for flavouring their soup. They form an important article of commerce amongst the natives of the islands of the Indian Archipelago, Cochin-China, the islands belonging to Australia, &c Thousands of Malay proas are annually engaged in this fishery, and the produce taken to Canton is sold, at an average, for about forty-five Spanish dollars per picul (=133⅓ lbs). Macassar is the great market for the commodity, and about 8,333 cwt. are annually exported from thence to Canton. In that market not fewer than thirty varieties are distinguished, varying from 5 to 110, or 115 dollars a picul, according to quality. Several species of the *Holothuriidæ* are found on the British coast; and one species, which is taken on the coast of Naples, is eaten by the poorer inhabitants of that country. The young of the *Holothuriæ* are very small, those of the species found on the Mediterranean coast being about eight-tenths of a line long. They are ciliated, move with quickness by means of these vibratile cilia, and swim rapidly by a movement of rotation round their axis. They have been described as a distinct genus under the name of *Auricularia*.



Holothuria.

Homarus. *The Lobsters.*—A genus of decapodous *Crustacea* belonging to the order *Macroura*, and family *Astacidæ*. The most important species of the genus is the common lobster, *H. vulgaris*, and is too well known to need description. The general colour, when alive, is a dull pale reddish-yellow, spotted with bluish-black. When boiled it becomes red. In a commercial point of view, this species, from the esteem in which it is held as an article of food, is perhaps the most important of all the Crustacea. They are taken on various parts of our coast, and chiefly on rocky shores. From the coast of Scotland, and the Orkney and Lewis islands, it is stated 150,000 are annually sent to Billingsgate market. From Norway, 600,000 annually arrive there, and it is no uncommon thing to see in one day, in that market, not less than from 20 to 25,000 lobsters. The consumption, therefore, in Great Britian, must be immense. The principal season of their being sent to the London market is from March to August, though during the winter they are in excellent eating condition also. They are, according to all accounts, very stationary in their habits, and differ very much in colour and appearance in the different places where they occur. The lobsters are taken in pots similar to what are used for the capture of crabs. They very readily part with their large claws. When seized by one of them, the animal parts with it at once, and when suddenly alarmed by a loud noise, such as a peal of thunder, or the report of a cannon, they *shoot* their claws immediately. The restoration of the lost member takes place slowly, and it is a considerable time before the new member attains the size

of the old one. The ova are very numerous, and when the young are first excluded from the shell, they are very unlike their parent. A series of



Homarus vulgaris—The Lobster.

changes takes place before they assume the perfect form.

Homo. *Man.*—In Zoology man is placed at the head of the order *Primates*, and in a family by himself, *Bimana* (two-handed), or *Hominidæ*. He forms the only genus of the family, and there is but one species of the genus, *Homo sapiens*, man, "the beauty of the world; the paragon of animals." There are several very distinct varieties of the human species. Cuvier refers them all to three; Pritchard enumerates seven; Agassiz, eight; Pickering describes eleven; but most authors follow Blumenbach, who makes five. First is the *Caucasian*, or white race, to which belong the greater part of the European nations, and those of Western Asia. Second is the *Mongolian*, or yellow race, occupying Tartary, China, Japan, &c. Third, the *Ethiopian*, or the negro race, occupying all Africa, except the north. Fourth, the *American*, or red race, containing the Indians of North and South America; and, fifth, the *Malayan* race, occupying the islands of the Indian Archipelago, &c. See BIMANA.

Homoptera.—An order of insects, characterized by their wings, which are four in number, being entirely membranous and deflexed. The anterior are larger than the posterior, and do not lap over each other when in a state of repose. The pupæ are active, and the metamorphosis is semi-complete. This order contains some of the most anomalous forms to be met with amongst insects. The musical cicadæ CICADIDÆ, the strangely formed lanthorn flies FULGORIDÆ, the cuckoo-spit insects CERCOPIDÆ, the destructive APHIDES, and the extraordinary scale insects COCCIDÆ, are all types of well marked groups. All the species belonging to this order subsist upon vegetable juices, and the females of many are furnished with a scaly ovipositor, by means of which they penetrate into the substances of plants, and there deposit their eggs.

Hopeite.—A mineral substance found in the zinc mine of Vieille-Montagne, near Aix-la-Chapelle. It is a glassy transparent substance of a grayish-white colour, and of the specific gravity of 2·76. It contains oxide of zinc, cadmium, and probably phosphoric acid.

Hordeum. *Barley.*—A genus of glumaceous monocotyledonous plants belonging to the nat. ord. *Gramineæ*. As many as fifteen species of these grasses have been described, found wild in various places in both the Old and New World. About six of these are cultivated as an article of food, some of which have the grains of corn in the ear arranged in two rows, others in six. Belonging to the first group is the common summer barley of England, *H. distichum*; the species which cultivators generally appear to prefer, and which, though said to be a native of Tartary, has been found growing wild in Mesopotamia, on the banks of the Euphrates. *H. gymnodistichum*, is what is known as the naked barley, and *H. zeocriton* is the battledore, or sprat barley. Neither of these species are much cultivated in England, and their original native country is unknown. Belonging to the second group, or six-rowed barleys, is the bere, bigg, or winter barley of farmers, *H. hexasticlum*, which though an inferior kind to the summer barley, is valuable for ripening quicker, and is therefore well adapted for northern climates, which have short summers. *H. gymno-hexasticum*, the naked six-rowed barley, is an extremely productive species, and in some parts of Europe is more esteemed than any other. Another curious species is found in India, with naked grains, and having very much the appearance of a species of wheat. It has been sent to this country under the name of "tartarian wheat," and is described under the name of *H. cegiceras*. What are called black barleys are only varieties of the commoner kinds, and receive that name from the dark colour of their husks.

Horia.—A genus of insects belonging to the heteromerous *Coleoptera*, tribe *Trachelia*, and family HORIIDÆ. The species are few, but they are of considerable size, and natives of warm climates. The larvæ of these insects live as parasites in the nests of certain hymenopterous insects. *H. maculata*, a West Indian species, has been observed to lay its eggs in the nest of a wild carpenter bee, *Xylocopa teredo*, which makes its cells in the trunks of trees. The larvæ, when hatched, feed upon the ova which laid up for the

larvæ of the bee, which in consequence are starved to death.

Hornblende.—A mineral. See AUGITE.

Hortensia.—A genus of plants. See HYDRANGEA.

Hoya.—A genus of dicotyledonous plants belonging to the nat. ord. *Asclepiadaceæ*. Several of the species of this genus are cultivated in our hot-houses. *H. carnosa*, a native of India, has, on account of its curious wax-like blossoms, received the name of wax plant. See ASCLEPIADACEÆ.

Humboldilite.—A mineral found in the lava of Vesuvius, of a brown-yellowish, or greenish-yellow colour, of a vitreous lustre, translucent, and of a specific gravity of from 2·9 to 3·104. It occurs in right square prisms of six, eight, or sixteen sides, or in masses.

Humboldtine. *Oxalate of Iron.*—A mineral substance found in Bohemia and Hesse, and occurring either crystalline or massive. Specific gravity, 2·13.

Humboldtite.—A mineral so called, found in the Tyrol, the Harz, in North America, and near Edinburgh. It is a borosilicate of lime, and is synonymous with DATHOLITE.

Humirium.—A genus of dicotyledonous plants belonging to the nat. ord. *Meliaceæ*, or, according to some botanists, forming the type of a small family to which it gives its name, *Humiriaceæ*. This genus contains several species which are trees or shrubs, and are natives of tropical America. *H. floribundum* is a tree twenty or thirty feet high, and gives out from its trunk, when incisions are made in it, a yellow liquid balsam of an agreeable smell, and known by the name of the balsam of Umiri. Its properties resemble very much those of the balsam of Copaiva and balsam of Peru. *H. balsamiferum*, a tree forty feet high, and growing in Guiana, gives out a resinous substance of a red colour, resembling styrax in smell. After it has exuded from the tree it becomes hard, when burned exhales an agreeable odour, and is employed in America as a cure for tape worm. The natives of Guiana, and the negroes, use the bark cut in slips to burn as flambeaus.

Humulus. *The Hop.*—A genus of plants. See CANNABINACEÆ.

Hura.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and containing a species which grows in the West Indies, and abounds like the rest of the family in a milky juice. It grows to the height of a considerable sized tree, and is known by the name of the sandbox tree, *H. crepitans*. The milky juice is so acrid as to produce blindness in a few days after touching the eye. The fruit is about the size of a middling apple, and when fully ripe opens with great elasticity and noise, and scatters the seeds to a distance. These when taken into the stomach produce violent, drastic purgative effects, which have occasionally brought on very dangerous symptoms.

Huronite.—A mineral substance found on the borders of Lake Huron in America, associated with boulder hornblende. It is of a clear yellowish-green colour, and has a specific gravity of 2·8625. It is a hydrated silicate of alumina and lime.

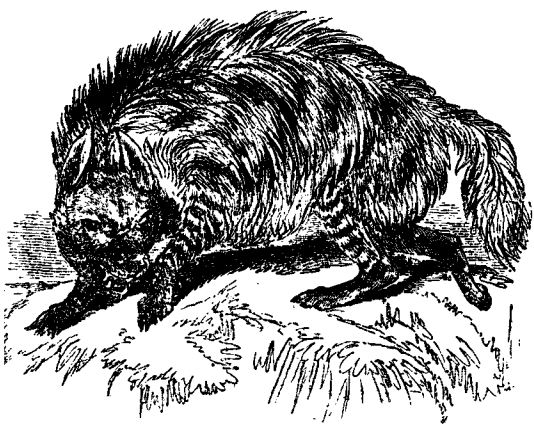
Hyacinth.—A mineral substance composed of silica and zirconia, transparent, and obtaining its name from its colour resembling that of the plant called hyacinth. It is a variety of ZIRCON, and forms one of the precious gems. Several varieties occur, such as the oriental hyacinth, the occidental hyacinth, &c.

Hyacinthus.—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, suborder *Scilleæ*, and containing several species of bulbous plants, much cultivated in our gardens. The most common is the common hyacinth, *H. orientalis*, a plant which, from its beautiful flowers, is more esteemed than almost any other in our gardens. The Dutch florists excelled in the culture of these bulbs, and the dealers of Haarlem had at one time upwards of 2,000 varieties!

Hyæna.—See HYÆNINA.

Hyænina. *The Hyænas.*—A tribe of animals belonging to the class *Mammalia*, order *Feræ*, and family *Felidæ*. The hyænas are digitigrade animals, with more or less elongate limbs, and the body depressed posteriorly. The genus *Hyæna* is the type, the species of which are distinguished by their having four toes to each foot, thick, short, blunt claws, and no small tubercular teeth in the lower jaw behind the molars. Their teeth are thirty-four in number—eighteen in upper and sixteen in lower jaw. The molar teeth are five on each side in upper, and only four on each side in lower jaw. The structure of their teeth enables them to crush the bones of the largest prey, and the muscles of the jaws and neck are so powerful, that it is almost impossible to take from them anything they have seized. They are less sanguinary in their habits than the cats, and live more upon dead animals, preferring even flesh which has begun to become putrid. In general form, the hyænas resemble the dogs, but are easily distinguished by the obliquity of their bodies and their peculiar gait, which gives them the appearance of having the hind legs shorter than the fore ones. Not that they are so in reality, but they appear so because they are always in a state of flexion. The muzzle is obtuse, like the dog's, and the tongue is rough, like that of the cat's. They are nocturnal animals, live during the day in caves, and sally out at night to seek their food. They are useful as scavengers in hot climates, as they carry off all sorts of carrion from the streets, and they will even enter churchyards to disinter the dead. Between the anus and tail they have a glandular pouch, which secretes a thick, unctuous humour, of a very bad smell. Many fabulous stories used to be told in former times about the hyænas. They were said to be hermaphrodites, changing their sex every year; the shadow of their bodies falling upon

that of dogs rendered them dumb; and they could imitate the voice of man, and even call him by name. The hyænas are all natives of the Old World, and are found inhabiting Asia and Africa. The common or striped hyæna, *H. vulgaris* or *striata*, was well known to the ancients. It is of a yellowish-gray colour, with transverse black bands. A long, black mane, waved with yellow, extends from the neck, along the back, to the tail. The ears are long, conical, broad at the base, nearly naked, and of a brown colour. It is an unsociable, solitary animal, inhabiting caves and the chasms of rocks; but is nevertheless easily tamed by man, and is susceptible of strong attachment to those who behave kindly to it. Travellers mention it in various places as being domesticated like the dog, and even performing the duties of a watch-dog. It is generally believed that this animal is alluded to in the Bible, and that the "valley of Zeboim," mentioned in 1 Sam. xiii. 18, means the "valley of hyænas," the Arabic name for this animal at the present day being dzuba or dubba. The striped hyæna is a native of Persia, Syria, Arabia, Egypt, Barbary, and Abyssinia. A variety of it is also found at the Cape of Good Hope, where it is called the Strand wolf by the colonists, and has been described as a separate species, under the name of *hyæna villosa*. The spotted hyæna or tiger wolf of the Cape of Good Hope, *Crocuta maculata*, is rather smaller than the striped hyæna, and is of a yellowish-brown colour, marked with numerous deep brown roundish spots. It is a voracious and destructive animal, and very cunning. Its depredations annoy the farmers very much, and numerous methods are adopted by them for catching it; but its cunning generally enables it to elude them all. It is said to have a preference for human flesh, and to attack children, and carry them off in their powerful jaws. It is a native of South Africa, especially of the neighbourhood of the Cape of Good Hope. Several species of fossil hyænas have been found in the tertiary formations. Remains of one species, *Hyæna spelæa*, occur abundantly in England, especially in the ossiferous caverns, as at Kirkdale, in Yorkshire. This species must have been larger than the recent species, and appears to have been common throughout Europe.



Hyæna vulgaris—Striped Hyæna.

Hyænodon (ὑαινα, hyæna; ὀδους, tooth).—A genus of extinct fossil animals found in the tertiary formations of Europe, and distinguished by its having the front molar teeth larger than the back ones, as in the didelphidæ of the present day. This peculiar genus is considered to be an intermediate link between the ordinary *Carnivora* and *Didelphidæ*.

Hyalæa.—A genus of molluscous animals belonging to the class *Pteropoda*, and family *Cleodoridæ*, and synonymous with *Cavolina*. The animal is furnished with two wing-like expansions or fins, which are united by a semicircular ventral lobe, the equivalent of the foot of the gasteropods; and the mantle has two long appendages passing through the lateral slits of the shell. The shell is of a globular form and translucent, with a slit on each side, and the posterior extremity tridentate. The *Hyalæas* are hermaphrodite, the two sexes being united in the same individual. They were long misunderstood, and this partly from the fact that naturalists had always mistaken the posterior for the anterior extremity. The species are all marine, living in the open ocean, and are for the most part nocturnal animals. They use their cephalic fins as wings, and move through the water by beating the surface with them, as butterflies do the air with their wings. They constitute a great part of the food of crustacea and other marine animals. About twenty species are known (some of which are now referred to sub-genera), amongst which the largest, handsomest, and best known is the glassy chariot or Venus' chariot, *H. tridentata*, an inhabitant of the Mediterranean, Atlantic, and Pacific Oceans.

Hyalonemidæ. *Glass Rope Corals.*—A family of zoophytes. See ANTHOZOA.

Hydatida (ὑδατις, bladder).—An order of *Entozoa* or intestinal worms. See ACEPHALOCYSTS.

Hydatina.—A genus of minute animals belonging to the class *Rotatoria*, and forming the type of the family *Hydatinæa*. The common

species, *H. senta*, found in stagnant fresh water, is of a conical shape and hyaline structure, and has the margin of the rotatory organ ciliated. This species forms a favourable subject for microscopic examination, and is the one which Ehrenberg used as the basis of his investigations upon the organization of the rotatoria.

Hydnocarpus.—A genus of plants. See FLACOURTIACEÆ.

Hydnora.—A genus of plants. See CYTINACEÆ.

Hydra. *The Fresh water Polype.*—See ANTHOZOA.

Hydrachnidæ. *Fresh water Spiders.*—See ACARIDÆ.

Hydradephaga.—A group of insects inhabiting the water. See HYDROCANTHARI.

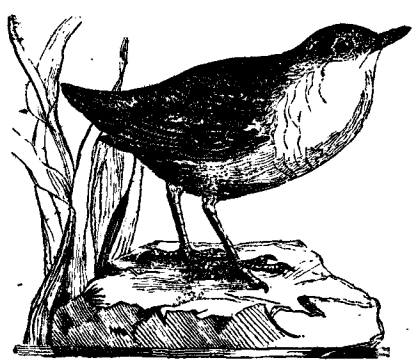
Hydrangea (ὕδωρ, water; ἀγγος, a vessel).—A genus of dicotyledonous plants belonging to the nat. ord. *Saxifragaceæ*, sub-order *Hydrangeæ*, of which it forms the type. The plants of which this genus is composed are elegant shrubs, several of which are cultivated as ornaments to our gardens and shrubberies. *H. Hortensia*, the most common species, and the best known in our gardens, is a handsome shrub, with opposite, oval, glabrous leaves, and terminal corymbs of flowers, which are nearly spherical, and about seven inches in diameter. It is a native of China and Japan, and is often called hortensia or rose of Japan. The flowers at first are of a rosy hue, and it is very curious that they become blue as they get older. They are said to show these colours most remarkably when they are cultivated near the sea. In the Channel Islands, for instance, and particularly in the island of Sark, they reach a large size, and are remarkable for the brilliancy of their colours. In favourable situations a hydrangea will attain a size sufficient to cover a space of thirty feet in circumference, and will produce upwards of a thousand flowers in a single season. About thirty-five different species have been described. The leaves of *H. Thunbergii* are dried and used in Japan as a kind of tea, which, for its excellence, is called by the natives ama-tsja, or tea of heaven.

Hydrargyrum (ὕδωρ, water; ἀργυρος, silver).—See MERCURY.

Hydridæ. *Sea Snakes.*—A family of reptiles belonging to the order *Ophidia* or snakes, and sub-order *Colubrina*. They have the tail compressed or conical, the ventral shields narrow, hexagonal or band-like, the hinder limbs not developed, the eyes and nostrils vertical, and the pupil round. The species are very numerous, and are arranged in two groups. In the one, *Hydrina*, the tail, with one exception, is compressed, the belly keeled with two rows of small scale-like shields, often united together into a single, broad, six-sided, often two-keeled shield. The anterior teeth are large, and grooved on the front edge. These are true sea snakes; they coil themselves up on the shore, living on sea-weeds, and lay their eggs on the sand. They are often found asleep on the surface of the sea, when they are easily caught, as they cannot descend without first throwing themselves on their back, probably to repel the air in their large vesicular lungs. They are often thrown ashore by the surf, and are sometimes found in rivers, having been brought in by the tide; but they can only live a short time out of salt water. They are often caught in nets, and are held in great dread by the fishermen, on account of their venomous bite. *Hydrus* is the type of this group, a genus containing several species, distinguished by having a small head, and the body covered with scales. They are taken in the seas of India and Australia. In the other group the tail is conical and tapering, the belly with more or less broad, bandlike shields, and their dwelling is in rivers and ponds.

Hydrilla.—A genus of monocotyledonous plants belonging to the nat. ord. *Hydrocharidaceæ*. One of the species, *H.* (*Serpicula*) *verticillata*, a native of India, is used in that country in the process of refining sugar, in the same way that clay is employed in other countries. A layer of the plant being spread upon the surface of the sugar, water is allowed to percolate through the mass.

Hydrobata.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Turdidæ*. Several species have been described, but the best known and typical is *H. aquatica*, the water ouzel, water blackbird or dipper. In manners and habits this bird is more removed than any other species from the order to which it belongs. With the form and plumage of the blackbirds, it combines the method of seeking its food of the pelicans, grebes, and divers, &c., plunging into the water, descending to the



Hydrobata vulgaris—Water Ouzel.

bottom, and moving about there as if it were in the air. The feet, however, are not webbed, but its short legs and long curved claws are well adapted for securing a steady footing on slippery stones, whether above or beneath the surface. It

is about the size of a starling, of a blackish-brown above, and waved with gray beneath. It is found near torrents and waterfalls amongst rocks in mountainous countries, such as the Pyrenees, Alps, Scotland, &c., and flies swiftly in a straight line, skimming the surface of the water like the kingfishers. It lives solitary, except at the breeding season, when only one male and one female are seen together. The nest is dome-shaped, and is formed of water plants and moss interwoven, with a lining within of dry leaves. It is often placed in some mossy bank overhanging the stream, and may be even occasionally seen under a projecting stone forming part of a cascade, and behind a sheet of falling water. It is generally of a colour resembling the locality where it is placed, and is in consequence difficult to be seen. The water ouzel feeds upon fresh water mollusca, and the larvæ of water insects, and is even said to devour great quantities of salmon roe. It has a pleasing song, powerful and elegant, with much variation in the notes, many of which are peculiar to itself, intermingled with a little of the piping of the woodlark. It startles the ear as its sonorous sound comes mingled with the hoarse noise of the torrent or the rushing of the wintry waterfall, for it is often heard as early as February.

Hydrocanthari or **Hydradephaga** (ὕδωρ, water; κανθαρος, a beetle; ὕδωρ and φαγω, to eat). —A tribe or section of insects belonging to the pentamerous coleoptera, and consisting of the two families *Dyticidæ* and *Gyrinidæ*. They are all aquatic beetles, living in stagnant water, and very voracious, their larvæ being still more so than the perfect insects.

Hydrochærus (ὕδωρ, water; χοιρος, a pig. *The Capybara.*—A genus of rodent animals belonging to the order *Glires*, and family *Hystricidæ*. This genus is characterized by having composite, rootless grinders, the hinder one formed of many plates, harsh, bristly fur, and large, partially webbed hoof-like claws. They live on herbs, and frequent places near water. *H. capybara*, the only species, is a native of Brazil, Guiana, and the tributaries of the Amazon, grows to the size of a hog of two years old, and is known by the name of water hog, cabiai, or capybara. Though its chief food consists of vegetables, as sugar cane, &c., yet it is said also to eat fish, and for that purpose frequents rivers, swimming with the same facility as the otter. It is of a gentle disposition, shy and timid, and readily tamed. These animals collect in large troops, and at the least warning of danger, seek refuge in the water, in which they conceal themselves, leaving only the nostrils above water. The flesh is said to be good eating.

Hydrocharidaceæ. *The Frog-bit family.* —A nat. ord. of monocotyledonous plants, composed of aquatic species, inhabiting ditches, lakes, and rivers in various parts of the world. They are either floating or creeping, and throw out long floral peduncles; the flowers are rather small, and the fruit ripens under water. They are mostly natives of temperate climates, though several are found also within the torrid zone. Some of the genera of which the family is composed are widely distributed over the globe. One of the most remarkable of these is *Vallisneria*, the species *V. spiralis*, a native of Italy, being well known as a subject for microscopic observations; the circulation of the sap or the movement in the interior of the cell, called *Cyclosis*, being well seen in the leaves. This plant is diœcious, and at the time of flowering, the male flowers are detached from the mud of the water in which they grow and float on the surface. At the same time the female flower develops a long, spiral peduncle, by means of which it reaches the surface of the water, so as to allow the application of the pollen. The genus *Anacharis*, an American plant, lately imported to this country, has already become a great pest to many parts of Great Britain. See ANACHARIS. The genus *Stratiotes* occurs in many parts of Europe, and one species, *S. aloides*, the water soldier, is found in Great Britain.

Hydrocotyle (ὕδωρ, water; κοτυλη, cavity). —A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and sub-order *Orthospermeæ*. Numerous species have been described, but none of them are of much importance to man. *H. vulgaris*, or pennywort, is a native of Britain, and is easily known by its round, shield-shaped, double crenate leaves, which lie flat on the ground, and are about the size and form of a penny. It is a native of damp, moist situations, and has very erroneously been supposed to produce the rot in sheep that feed upon it. Hence it is often called sheep-killing penny grass, white rot, fluke wort, and sheep's bane.

Hydroida. *Hydroid Polypes.*—A section of zoophytes belonging to the order *Polypifera*. See ANTHOZOA. From the observations, however, of the most recent naturalists, the animals of this order are found to be closely allied to, and indeed in systematic arrangement, must form part of the pulmograde order of *Medusæ* or the *Discophora*.

Hydrometridæ.—A family of insects belonging to the order *Hemiptera*, composed of species which are constantly found upon the surface of standing or running waters, upon which they possess the power of progression as completely as other insects have on land. The genus *Hydrometra*, which gives its name to the family, merely creeps upon the water, the body of the insect being considerably elevated. The most typical is the genus *Gerris*, the species of which are very active. See GERRIS.

Hydrophilus (ὕδωρ, water; φιλεω, to love). —A genus of insects belonging to the pentamerous *Coleoptera*, forming the type and giving its name to the small family *Hydrophilidæ*. The insects belonging to this genus are of a large size, of a convex form, and of a nearly perfectly ellip-

tic shape. The species are all aquatic, and their intermediate and posterior legs are flattened so as to have the make and utility of oars. They are also furnished with two long, very solid and sharp-pointed spurs, which, when the insect is laid hold of incautiously, can inflict a sharp wound. They are vegetable feeders. The female deposits her eggs in a little nest or cocoon, composed of a gummy substance, which is ejected from the abdomen, and in this nest the eggs float till they are hatched. The larvæ, unlike the parents, are carnivorous and extremely voracious, living upon mollusca, the fry of fishes, &c. *Hydrophilus* (*Hydroüs*) *piceus* is one of the largest beetles of this country, measuring about an inch and a half in length, and is not uncommon in some parts of England.

Hydrus.—A genus of water snakes. See HYDRIDÆ.

Hyla. *The Tree Frog.*—A genus of frogs. See BATRACHIA.

Hylæosaurus (ὑλη, forest; σαυρος, a lizard).—A genus of extinct fossil saurian reptiles. See DINOSAURIA.

Hylobates (υλοβατις, wood walker; one that walks in woods). *The Long-armed Apes.*—A genus of animals belonging to the class *Mammalia*, order *Primates*, and family *Simiidæ*. The species belonging to this genus are natives of India, and, in a state of domestication, mild and gentle in their manners. They have long arms, receding foreheads, callosities on the buttocks, and are destitute of tail and cheek pouches. Several species are described, and they are represented as very human in their appearance, mimicking also the actions of human beings. They all of them howl, and in some the guttural sacs are very visible externally. *H. lar*, the gibbon, is remarkable for the length of its arms, which, when the animal is standing, reach to the ankle joints. It is of a slender form, black, with white hands and feet, and a white circle round the face. They chiefly live in trees, sweeping from branch to branch with great agility. Suspending themselves by their long arms, they launch onwards by an energetic muscular movement, seizing with wonderful precision the distant branches, and continuing their progression without any pause or perceptible effort. The gibbon is of an ungainly figure, but is gentle and tractable. *H. agilis*, the wow-wow or oungha, is about two feet seven or eight inches high, of a brown colour, with a circle of pale fulvous round the face and lower part of the back, and its agility and activity are even greater than the preceding. The wow-wow is a timid animal, but when it reaches the forest it sets pursuit at defiance, swinging, leaping, and throwing itself from tree to tree with great rapidity. It lives in pairs, and derives its name, wow-wow, from its peculiar howling cry. The siamang, usually recorded as a species of *Hylobates*, but lately placed in a genus by itself, *Siamanga*, *S. syndactyla*, differs considerably from the other long-armed apes, having the second and third toes of the hind foot united by a narrow membrane the whole length of the first phalanx. It is wholly black, with the chin and eyebrows rufous, and the throat bare. The siamangs, unlike the other species, are slow and heavy in their movements, but are so vigilant as not easily to be surprised. They live in troops, which are conducted by vigilant and courageous chiefs, and these are looked upon by the natives of Sumatra, in the forests of which island these animals dwell, as invulnerable. At sunrise and sunset these creatures set up a dreadful howling, presided over by their chief, making the forests resound with their frightful cries.

Hymenæa.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Cæsalpiniæ*, and composed of trees with bifoliate leaves and corymbs of white or yellow flowers. The species best known is the locust tree, *H. courbaril*, a lofty, spreading tree, growing in the tropical parts of America. The seeds are enveloped in a cellular, mealy substance, which is sweet, like honey, and is eaten by the Indians with great avidity. From between the principal roots of this tree there exudes a fine transparent resin, resembling copal, of a red, or yellowish-red colour, which is collected in large lumps, and known by the name of gum animi or anime. Dissolved in rectified spirits of wine, this gum makes one of the finest kinds of varnish. Gum animi burns readily, emitting a very fragrant smell; it is therefore used for scenting pastilles; and fumigation from it has been employed in cases of asthma and dyspnœa. The timber of old locust trees is very hard and tough, and is in great request for wheel work, particularly for cogs. It is so very heavy that a cubic foot is said to weigh a hundred pounds. Many of these trees in the South American forests are of gigantic stature, some of them measuring eighty-four feet in circumference at the bottom, and sixty feet where the boles become cylindrical. *H. verrucosa* is a native of Madagascar and the East Indies; and probably the copal of these countries is the produce of this tree.

Hymenomycetes (ὑμην, a membrane; μυκης, a fungus).—The highest order of the *Fungi*, characterized by the peculiar mode of arrangement of the spores; the hymenium, or reproductive organs being naked. This order contains the agarics (see AGARICUS), the *Polypori*, and the jelly-like plants called the TREMELLÆ.

Hymenoptera (ὑμην, membrane; πτερον, wing).—An order of insects constituting a very natural group. They are characterized by having four wings, which are entirely membranous. The basal portion is provided with only longitudinal nervures, without cells or reticulations, and the apical portion is furnished with only a few. The anterior pair are much larger than the posterior, and they cross horizontally over the body when in a state of repose. Of all the

orders into which insects are divided, the hymenoptera contains the greatest number remarkable for development of instinctive powers and social qualities. The females have the abdomen armed with a multivalve saw ovipositor, by means of which they are able to perforate the various substances or bodies in which they deposit their eggs, or with a sharp needle-like sting, by means of which they are able to kill their enemies or render them torpid and powerless. They are remarkable for the great development of the aërial tracheæ, which in many species are placed in their abdomen in pouches, and are very large in comparison with the size of the insects. They undergo incomplete metamorphoses, and in the greater number their larvæ are soft, whitish coloured, and without feet. Amongst the most remarkable families of which this order is composed, are the bees, see APIDÆ; the wasps, see VESPIDÆ; the sphexes, see SPHECIDÆ; the ants, see FORMICIDÆ; the CHALCIDIDÆ, ICHNEUMONIDÆ, CYNIPIDÆ, TENTHREDINIDÆ, &c.

Hyodontidæ. *The Hyodonts.*—A small family of abdominal malacopterygious fishes, not far separated from the great salmon family. The species are generally characterized by having compressed bodies, like the herrings, and a keeled belly, without the serrations which are found in these latter fishes. They are nearly related to the genus *Chirocentrus*, in the family *Clupesocidæ*, but are distinguished from them by possessing pancreatic cæca. They are all natives of the fresh water, and are found in North and South America, Borneo, &c. The typical genus, from which the family derives its name, is the genus *Hyodon*, the fishes belonging to which have scaly, greatly compressed bodies, with a sharp back and belly. Their air-bladder is large, and communicates with the esophagus. They are small, and all natives of the fresh waters of North America, where they are known by the name of gold eyes. They resemble in habits the trouts, as they feed on insects, and afford good sport, taking the artificial fly freely. Their mouth is well armed, as strong teeth are found far back on the palate, as well as on the tongue and jaws.

Hyoscyamus. *The Henbane.*—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and containing several species, of which the most important is the common henbane, *H. niger*. This plant grows wild in many parts of England, and is a biennial, with dingy yellow flowers, exhibiting beautiful purple reticulations, hairy viscous leaves, and a bilocular operculate capsule. It has a disagreeable stupefying odour, and a nauseous, somewhat acrid taste. Henbane is used medicinally to procure sleep, and to allay pain and spasmodic action, and its virtues depend upon the presence of an alkaloid called *Hyoscyamine*. It is often given instead of opium, from the fact that it does not constipate. The leaves yield by expression a large quantity of juice, whence an extract is prepared. An empyreumatic oil is also obtained from the plant, which is an energetic narcotic poison. The roots of henbane have sometimes caused poisoning by being mistaken for parsnips.

Hypericaceæ. *The Tutsan family.*—A nat. ord. of dicotyledonous plants, composed of trees, shrubs, undershrubs, and herbs, many remarkable for the resinous juices they possess. They are scattered over the temperate and warm parts of the globe, and are especially abundant in the southern states of the North American Union. The juice of some of them is slightly purgative and febrifuge. One of the family, *Vismia guianensis*, a native of America, gives out a yellow juice which is known in commerce as "American gamboge." The genus *Hypericum*, however, is the type of the family, the species of which are known by the name of "St. John's Wort." Many of them are pretty ornamental plants, and are accordingly cultivated in our gardens and shrubberies. One British species, commonly called "Aaron's beard," *H. calycinum*, is, from its large and handsome yellow flowers, a general favourite. *H. perforatum*, another species, found in Great Britain, as well as in the greater part of Europe, in the north of Asia, and in Africa, was well known to the ancients. The flowers are of a bright yellow colour, dotted and streaked with purple, and when rubbed emit a powerful lemon-like scent, and stain the fingers with dark purple. The whole of the plant contains a powerful volatile oil, which is aromatic, and possibly astringent; and, when boiled with alum, yields a yellow dye, which is used for colouring wool. The common people of Germany and France gather it with great ceremony on St. John's Day, and hang it in the windows and about their houses as a charm against evil spirits, storms, thunder, and all other calamities. At one time the people of Scotland used to carry it about their persons as a charm against witchcraft and enchantments, and they fancy it prevents ropy milk, by milking upon the fresh herb.

Hyperoodon (ὑπερῳα, palate; ὀδους, a tooth).—A genus of animals belonging to the order *Cete*. See DELPHINIDÆ.

Hyphomycetes (ὑφαω, to weave; μυκης, a fungus).—An order of *Fungi*, composed of microscopic plants growing as moulds over dead or living organic substances, and interesting from containing so many moulds and mildews, and various parasitical fungi to which the diseases of plants, and in some cases of animals, have been attributed. See BOTRYTIS, &c.

Hypnum.—A genus of mosses, containing numerous species, many of which are very elegant and extremely common in this country in woods, growing on trunks of trees, banks, &c. Others grow in bogs and in water.

Hypogæi.—A family of gasteromycetous fungi, resembling in their underground habit of growth the truffles. See GASTEROMYCETES.

Hypsiprymnus. *The Kangaroo Rat.*—See MACROPIDÆ.

Hyrax.—A remarkable genus of animals belonging to the class *Mammalia*. With the general external form and appearance of a rodent animal, with a soft fur and bristles intermixed as in the cavys, this curious genus has the teeth of the rhinoceros, and the internal organization and skeleton of the true pachyderms. It belongs, according to the latest zoological arrangement, to the order *Ungulata*, family *Elephantidæ* (= Pachydermata of *Cuvier*), and sub-family *Rhinocerina*. It has seven molar teeth above and below in each jaw; two incisors above and four below; and no canines; four toes on its fore and three on its hind feet; and a simple tubercle in lieu of a tail. Three or four species are described. *H. Syriacus*, the daman, is a native of Syria,

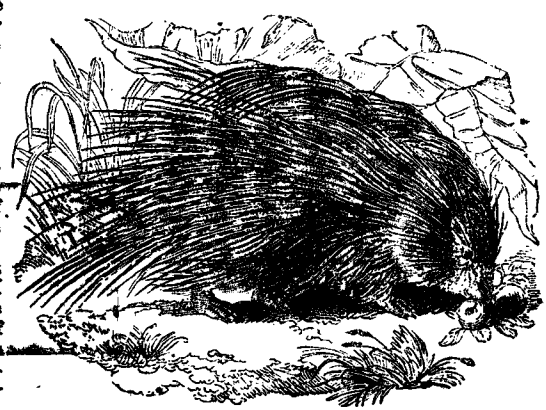
Hyrax Syriacus—The Daman.

Arabia, and Abyssinia, living in the mouths of caves or in the clefts of rocks. In Arabia and Syria it is called Daman Israel or Gannin Israel, Israel's sheep or lamb. In the Scriptures it is called saphan, which our translators have rendered coney—and there seems no reason to doubt that this is the animal mentioned in the Bible as "the feeble folk," "that make their houses in the rock." They are gregarious animals, very mild, feeble, and timid, and easily tamed. They are from a foot to seventeen inches in length. *H. Capensis*, the klipdas, is a native of South Africa, and is said to be an exceedingly quick, and active little animal, about the size of our rabbit, skipping along the shelving ledges of the overhanging cliffs, leaping with great agility from crag to crag, and darting with incredible swiftness into the holes and crevices of the rocks, though it often falls a victim to the larger carnivorous animals and birds of prey that inhabit the same localities. The food of both these species of hyrax appears to consist of grain, fruits, roots, and the young shoots of shrubs, herbs, and grass.

Hyria.—A genus of fresh water bivalve shells belonging to the family *Iridinidæ*, and containing several species found in the rivers of South America.

Hyssopus. *The Hyssop.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, containing several species of undershrubs, growing in abundance in Europe and Central Asia. The principal species is *H. officinalis*, a plant which has been celebrated as a tonic cordial. From the plant is obtained a distilled water and an essential oil. The hyssop of Scripture has been supposed by some botanists to be a variety of this plant, *H. officinalis, var. orientalis*, or *angustifolius*, though others assert it to be a species of *Capparis*, *C. Ægyptiacus*, the Egyptian caper.

Hystricidæ. *The Porcupine family.*—A family of animals belonging to the class *Mammalia*, and order *Glires* or *Rodentia*. The animals of this family have four molar teeth in each jaw above and below, the tongue and body covered with cylindrical spines or bristly hair, and the clavicles either incomplete or wanting. A considerable number of species belong to the family, and, as they vary in many respects, they have been divided into several sub-families. The true porcupines, *Hystricina*, are covered with spines, have a short tail, compound rooted grinders, and live on herbs. The feet are plantigrade, the anterior having four, and the posterior five toes, armed with large nails. The genus *Hystrix* contains several species, the best known of which is the common porcupine *H. cristata*. This well known animal is a native of India and Africa, and is now found wild in Italy, though not originally an inhabitant of Europe. When full grown the porcupine is about two feet in length. The spines,



Hystrix cristata—Common Porcupine.

or "quills," with which the body is covered, are about the thickness of a goose quill in the middle, supported at the base by a slender pedicel, and

terminating in very sharp points, striated longitudinally, and ringed alternately with black and white. The longest exceed a foot in length. In general they lie flat upon the body with the points directed backwards, but when the animal is excited they are raised by means of the subcutaneous muscles almost at right angles with the body, and then present a formidable appearance. Those of the tail are, as it were, cut off in the middle, and consequently open at both ends, and produce a loud rustling noise when the animal shakes its tail. The porcupine is a nocturnal animal, living in burrows or subterranean retreats during the day, and making its excursions for food during the night. It becomes torpid during the winter. Its food consists of roots, fruit, bark, and other vegetable substances. That it can shoot its quills or spines when enraged at its enemies, and that it is able to supply its young with water by means of its quills, which are hollow and open at the extremity, are fables that have been oft repeated, and show the credulity of the ancients. The *Cercolabina* have a more or less elongated tail, and live on trees, eating the leaves. The urson, cawquaw, or Canada porcupine, *Erethizon dorsatum*, is an unsightly and sluggish animal, approaching somewhat to the form of a beaver, and principally found in the northern states of the Union and in Canada. The spines are short, sharp, and almost concealed by the hair, with which they are intermingled, and the tail is about six inches long. This species attains the length of about two feet, and lives at the roots of old trees where, if not employed in feeding, it passes most of its time in sleeping. The prehensile porcupine *Cercolabes prehensilis*, is remarkable for the length of its tail, which is eighteen inches, and prehensile. The animal itself is about a foot in length, is a native of Brazil, and other parts of South America, and inhabits woods, clinging to the branches of trees by its tail, in the manner of some of the monkeys. The spines with which the body is covered are short, sharp, and strong, the longest measuring only about three inches, and are white, with black tips. The *Dasyproctina*, *Hydrochærina*, and *Cavina*, have more or less rigid hair instead of spines, have no tail or only a very short one, and long hoof-like claws. See DASYPROCTUS, HYDROCHÆRUS, and CAVIA.

Hystrix.—*The Porcupine.* See HYSTRICIDÆ.

I

Ibacus.—A genus of decapodous crustacea belonging to the division *Macroura*, and family *Scyllaridæ*. It is distinguished from the other genera of the family by its triangular carapace, which is much longer than broad, and is narrowed posteriorly. Three recent species are known, one in the seas of Asia, one in Australia, and one in the West Indies. A species occurs fossil in England.

Iberis.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*. The species are herbaceous or slightly shrubby plants, generally glabrous with white or purplish flowers disposed in corymbs. Several species are cultivated in gardens as ornamental plants, and are known by the name of candy-tufts. They are principally European plants, though some grow also in Asia. One species is British.

Ibis.—A genus of birds. See ARDEIDÆ.

Ibla.—A genus of *Crustacea* belonging to the order *Cirripedia*. See LEPADIDÆ.

Ibycter.—A genus of birds belonging to the order *Accipitres*. See POLYBORINÆ.

Ichneumia.—A genus of animals belonging to the class *Mammalia*, order *Feræ*, family *Felidæ*, and sub-family *Viverrinæ*. This genus contains two or three species which have been separated from the true ichneumons, *Herpestes*, and has as its type the white tailed ichneumia, *I. albicaudis*, which inhabits South Africa and Senegal. These animals live in burrows and feed upon insects, as well as upon flesh.

Ichneumon.—A synonym of the genus HERPESTES, and containing the well known ichneumon of the Nile.

Ichneumonidæ. *The Ichneumon Flies.*—A family of hymenopterous insects corresponding with the Linnæan genus *Ichneumon*. The insects of this family are characterized by having a narrow linear body, long vibratile antennæ veined wings, and long slender feet. There are numerous species, the manners and habits of which are well deserving study. As the animal of Egypt known by the name of the ichneumon was supposed to keep down the numbers of crocodiles, by either destroying their eggs, or leaping down their throat when asleep and eating their way out through their entrails! so these insects have received the name of ichneumon because their larvæ are parasitic upon and help materially to diminish the number of lepidopterous insects which are injurious to man. They seek out the larvæ of these insects, and the females by means of their long ovipositors perforate the skin and in its substance deposit their eggs. As soon as the young are hatched, which they are in the bodies of their victims, they begin to eat the substance of their host, but avoiding the important organs of the animal, so as not to destroy life before they become full grown themselves. When that period arrives, the larva or caterpillar is left with nothing but its skin. The different species of ichneumons prey upon different species of caterpillars, each species in general selecting its own peculiar species of caterpillar. Sometimes the larva lives long enough to turn into a

pupa, but at the time when the last transformation ought to take place, instead of a butterfly forth comes an ichneumon. The ichneumons attack the larvæ of other orders of insects besides lepidoptera. Some of them are very small, such as some of the *Braconides* which deposit their ova in the bodies of the aphides, and others which infest the larvæ of the wheat fly, *Cecidomya*. The clover weevil and the wireworm are likewise subject to their destructive attacks, and such is their activity and address that scarcely any concealment can secure their prey from them. It has been estimated that out of 200 caterpillars of the cabbage butterfly, apparently full grown, only three butterflies are produced, the remaining 197 turning out ichneumons. It may thus be seen of what immense benefit these little creatures are to man in preventing the wholesale destruction of many vegetables which serve him as food. The perfect insects fly with considerable agility amongst trees and plants, especially frequenting the heads of umbelliferous flowers, and some of them emit when handled a powerful and by no means pleasant scent.

Ichthyology (*ἰχθύς*, a fish; *λογος*, a discourse).—The science which treats of the natural history of fishes.

Ichthyosarcolite (*ἰχθύς*, a fish; *σαρκος*, flesh; *λίθος*, a stone).—A genus of extinct fossil shells belonging to the family *Hippuritidæ*, and synonymous with *Radiolites* and *Sphærulites*.

Ichthyosaurus (*ἰχθύς*, a fish; *σαυρος*, a lizard).—An extinct fossil genus of animals allied to the lizards. See ENALIOSAURI.

Icica.—A genus of plants. See AMYRIDACEÆ.

Icteria.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Muscicapidæ*. *I. viridis*, the chattering flycatcher, is a native of different parts of the United States, especially Carolina. It is of a greenish-gray colour on the head, the upper part of the neck, and beak; orange-yellow on the chest and front of the neck, and white on the lower part of the body. These birds build their nests in thickets or amongst the wild vines, and they are very jealous of their habitation. If the male perceives any object which it dislikes, it makes the thicket resound with the most extraordinary and uncommon cries. Sometimes these resemble the flapping sound of the wings of a duck when flying, at first rapid, then more feeble, becoming afterwards slow, and ultimately ceasing altogether. At other times they resemble the bark of a dog, followed by cries coming from its chest, more like those of a quadruped than a bird, and finally terminating in the mewing of a cat. These different sounds are pronounced with great vehemence, and in so many different ways that they produce a sort of ventriloquism; and this sort of babbling he will continue nearly all night long, especially during the love season, when the weather is fine and the moon is shining. The food of these birds consists of insects and berries, especially the fruit of the solanum carolinense.

Icterinæ.—A sub-family of birds. See CASSICUS.

Icterus.—A genus of birds. See CASSICUS.

Ictides.—A genus of viverrine animals called binturongs, natives of India. It is a synonym of ARCTICTIS.

Ictinia.—A genus of birds. See MILVINÆ.

Idocrase (*εἶδω*, to see; *κρασις*, a mixture).—A genus or group of mineral substances composed of silica, alumina, and lime, with a little oxide of iron. They have indeed the same chemical composition as the garnet, but a different crystalline form. Several varieties or species occur, as *Vesuvian*, or the idocrase of Vesuvius, of a brown colour, found in masses ejected from Vesuvius, and accompanying garnets, mica, augite, &c. *Wiluite*, or the idocrase of Siberia, of an obscure green colour, found on the banks of the river Achtaragade, which flows into the river Wiloui in Siberia. *Egrane*, or the idocrase of Bohemia, of a liver-brown colour, found near Eger, in Bohemia. *Cyprine*, of a blue colour, found in Norway in company with thulite, white garnets, &c., and containing a small quantity of copper. *Manganesienne*, found in the Alps of Mussa, containing a portion of the oxide of manganese. These minerals are generally found in crystallized rocks, and occur in veins or small compact granular masses, &c. When they are transparent, they may be mounted in rings, and when cut they are sold at Naples under the name of "Gemmes de Vesuve."

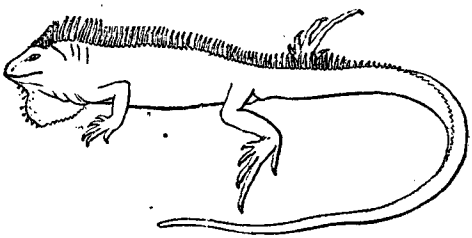
Idotea.—A genus of *Crustacea*. See ISOPODA.

Ignatia.—A genus of dicotyledonous plants belonging to the nat. ord. *Loganiaceæ*. *I. amara* is the plant from which are obtained the St. Ignatius' beans of India, which have been recommended in cases of cholera. The virtues which these beans possess depend on the presence of the principle of strychnia, and giddiness and convulsions have occurred when they have been used.

Iguana. See IGUANIDÆ.

Iguanidæ.—A family of saurian reptiles, forming, along with the AGAMIDÆ, the tribe *Strobilosaura*. This family corresponds with the Linnæan genus *Iguana*, and contains numerous species having the body covered with imbricate scales, of a square form, under the belly, and most frequently a prominent ridge upon the back and tail. They are in general very nimble reptiles, and live in warm climates. Some of them have a very long tail of a compressed form. Their legs are well developed, and their toes are armed with hooked claws. Some of the species live upon vegetables, others upon animal food. About fifty different genera are enumerated, the most typical of which, and which gives its name to the family, is the genus *Iguana*. The species of this genus are lizards of a large size, and inhabit South America and the West Indies, where

their flesh is esteemed a delicate article of food. They live for the most part on trees, but sometimes take to the water and swim with ease. *I. tuberculata* is the common iguana, and reaches



Iguana tuberculata—The Iguana.

the length of about five feet. It is of a more or less deep green colour, has a depending depressed dewlap under the throat, and the sides of the neck covered with tubercles. They are eagerly sought for in the spring, being considered then a great delicacy. They are formidable looking animals, though in reality timid and harmless. The female deposits her eggs, which are about the size of those of a pigeon, in the sand, where they are left to be hatched by the warmth of the sun.

Iguanodon (*Iguana*; ὀδους, a tooth).—A fossil extinct genus of reptiles of large size. See DINOSAURIA.

Ilex. *The Holly.*—A genus of plants. See AQUIFOLIACEÆ.

Ilicineæ.—A synonym of AQUIFOLIACEÆ.

Illecebraceæ. *The Knotwort family.*—A nat. ord. of dicotyledonous plants, containing a considerable number of species, which are small and uninteresting, and are found in barren places in various parts of Europe, Asia, and North America. Two or three occur in Great Britain, such as *Herniaria glabra*, or rupture wort; *Illecebrum verticillatum*, the whirled rush grass, &c.

Illicium (*illiceo*, to allure).—A genus of dicotyledonous plants belonging to the nat. ord. *Magnoliaceæ*, and sub-order *Wintereæ*. It contains few species, but these are widely distributed. They possess a very agreeable aromatic fragrance, and the capsules smell of anise. The most important species is the aniseed tree of China, *I. anisatum*, the fruit of which is known in commerce under the name of star anise. It is imported to Europe from Canton, and is a good deal used on the continent for the aromatic and carminative properties the fruit possesses. A volatile oil is distilled from the seeds, which, it is said, is employed to flavour the liqueurs known as the anisette de Bordeaux and the anisette de Hollande. The Chinese use it as a condiment, and as a stimulant medicine, and burn it as incense in their temples.

Impatiens.—A genus of plants. See BALSAMINACEÆ.

Imperator.—A genus of shells. See TURBINIDÆ.

Imperatoria.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and obtaining its name from its supposed imperial virtues in medicine *I. ostruthium*, the masterwort of old English herbalists, is a native of Europe and Newfoundland, occurring in damp meadows and woods, and its root has been much celebrated as an antidote against poisons, possessing diuretic and sudorific properties. When chewed it excites a copious flow of saliva, acts as an agreeable stimulant to the gums, and is recommended in cases of rheumatic toothache.

Inachus.—A genus of decapodous *Crustacea*, belonging to the division *Brachyura*, and family *Oxyrhynchi*. The carapace of the species of this genus is nearly triangular, scarcely longer than it is wide, and very gibbous above. They are small animals, and inhabit the coasts of the Atlantic and Mediterranean Seas, living generally at a considerable depth, and most frequently found on oyster banks. Their body is covered with down and hairs, to which corals or sponges attach themselves. The most common species is *I. scorpio*, which has been taken in the British Channel.

Indianite.—A mineral found disseminated along with garnet and hornblende, in felspar rocks, in the island of Ceylon and in the Carnatic in India. It occurs in granular masses of a white or rose colour, and has a specific gravity of 2·74. It is perhaps only a variety of *Anorthite*.

Indicator.—A genus of birds belonging to the sub-family *Indicatorinæ*, and deriving its name from the habits of the species; as, wherever they are seen, it is considered certain that in the neighbourhood there is a nest of bees. See CUCULIDÆ.

Indicatorinæ.—A sub-family of birds belonging to the large family CUCULIDÆ.

Indigofera.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, and tribe *Loteæ*. The species are herbs or small shrubs, with pinnate leaves, and purple, blue, or white flowers, in axillary clusters. Several of the species of this genus are cultivated for the sake of the blue colour furnished by them, so much used in dyeing, and known by the name of *Indigo*. *I. anil* is the American species, and is a shrubby plant growing from 2½ to three feet high. Its flowers are in axillary clusters much shorter than the leaves. *I. tinctoria* is the species generally cultivated in India, and is said to grow wild along the sands of Senegal. Its flowers are larger than the last, but some botanists aver that they are only varieties of the same plant. *I. argentea* is the species cultivated in Egypt, and is smaller than the preceding, being only about two feet

high. The cultivation of these plants is of extreme importance commercially, and gives employment to thousands of human beings. The best time for reaping the crop is when the flowers are just beginning to show; if cropped later, and when the fruit is formed, the quantity of colouring matter contained is much less. "When cut it is tied up in sheaves about 5¼ feet in circumference and carried to the factory, where a large vat is filled with them. They are strongly pressed down with bamboos and a cross beam, covered with water, and allowed to steep for twelve hours. They must not, however, be steeped too long, otherwise the indigo is injured. The liquor becomes yellow, and is drawn off by means of a plug at the bottom of the vat into a similar vessel, where it is agitated by means of bamboos for two or three hours. Grains form and separate. When they have ceased to deposit, a few pailsful of cold water or of lime water are added, and the whole gently stirred with a circular motion. The liquor is drawn off, the indigo at the bottom washed with water and placed in a copper boiler, where it is allowed to ferment; it is then placed on a bamboo frame, covered with a cloth in the form of a filter, and the liquor allowed to drain off. It is then pressed by means of screws, and cut into cakes." Indigo was known to the Greeks and Romans as a paint, but its value was not estimated in Europe till the middle of the sixteenth century. It did not make its way into general use, however, without great opposition. This chiefly arose from the *woad growers*, who were sufficiently powerful to be able to prevail upon several governments to prohibit the use of indigo as a dye. In Germany, in Saxony, and in England, in the reign of Queen Elizabeth, edicts were published forbidding its employment, and terming it "devils' dye," and "food for the devil." The chief importation is from Bengal,—but a portion of the imports to this country are also from Madras, Java, and the Philippine Islands in the East; and from Guatemala and Caraccas in Central America. An acre of ground produces about ten lbs. of indigo, but the crop is a very fluctuating one. In 1831, 7,299,605 lbs. were imported into Great Britain, of which 6,996,063 lbs. were from India. In 1832, only 6,353,065 lbs. were imported.

Indris.—A genus of quadrumanous animals. See LEMURIDÆ.

Infusoria. *Infusory Animalcules.*—A class of extremely minute beings, discovered by the microscope, inhabiting stagnant water, fresh or salt, in which plants are growing, or in which an abundance of decayed vegetable or animal matter is contained. Most of them are invisible to the naked eye, and species have been described from $\frac{1}{1500}$th to $\frac{1}{2000}$th of a line in length. So exceedingly minute are they in size, that it is calculated a moderate sized drop of water may contain 500 millions of these minims of creation. They are of very simple organization, as they are furnished with neither vessels nor nerves, are not symmetrical, have not distinct sexes, have no visible eggs, and are without determined or permanent digestive cavity. The chief organs of which they are composed appear to be internal spherical cavities, which frequently contain foreign particles supposed to serve as food, and which are derived from the surrounding water, entering into the substance of the body, and moving through it by the general contraction of the mass, and being expelled through the opposite side. Some have no visible locomotive organs; others have, and these are either cilia, or changeable processes as they are called, expansions of the substance of the body. The substance itself which forms the body is called *Sarcode*, and, in perhaps the greater number, is a glutinous, homogeneous, or slightly granular diaphanous mass. In some infusoria red specks are visible which resemble eyes, and by many zoologists are considered such; though from a want of all traces of a nervous system, and possessing no distinguishable cornea or lens, others deny them to be true eyes, and compare them to the red specks often seen in algæ. The food of the infusoria consists partly of vegetables and partly of animal decomposing matter, and they not unfrequently prey upon each other. They are the prey again of other aquatic animals, and as they occur in immense quantities in the water of the ocean, as well as in that of our fresh water ponds, and slow running streams, they contribute much to the nourishment of animals of a higher order which are useful to man. This has been particularly observed in the ocean, in high latitudes, where vegetable life ceases to be represented, but where animal life is still in abundance. Infusoria are there found to exist in inconceivable numbers, and form the principal food of the fishes inhabiting these regions. The manner in which they propagate is remarkable. This consists in spontaneous division, which is either longitudinal or transverse—in gemmation, the buds arising from near the posterior end of the body, and when fully developed, liberating themselves by the formation of a posterior ring of cilia — in the encysted process, cysts forming, which, when they burst, discharge a number of individuals which do not always resemble their parent in form—and in alternation of generations, the species which are formed in this way undergoing a kind of metamorphosis, the simple encysted form of an infusorial animal being changed into a free form, or into a form attached by a stalk, and then giving origin to new individuals by internal budding. As the multiplication by division takes place in geometrical progression, and as they need only to become encysted to produce swarms, we can easily understand their rapid propagation in fluids. They frequently occur in such immense numbers as to colour large tracts of water with very remarkable hues. Some species impart a blood-red hue to the water, and Ehrenberg has thrown out the conjecture that

these little creatures were the agents employed in the miracle worked by Moses in turning the waters of Egypt into blood. Others give a blue colour, while a third set tinge the whole surface with green. At sea, though singly invisible, they produce one kind of the phosphorescent light so often observed in the ocean. Formerly, before their history was well understood, they were erroneously considered to derive their being directly and spontaneously from the decomposition of animal or vegetable matter in water, and were, from their sudden appearance in such situations, and in such immense numbers, held to prove the truth of what is called "spontaneous generation." Infusoria can resist a degree of cold equal to 8° Fahr., and a degree of heat equal to 260°. Ehrenberg has devoted much time to the study and classification of these little creatures, and includes under the general name of infusoria, two large groups which he names *Polygastrica* and *Rotifera*. This latter group has now been proved to be of a much higher organization than the former, and has accordingly been removed from the class infusoria into a separate class by itself. See ROTATORIA. The polygastrica have also been proved to contain whole families and sections which are not true infusoria. Thus the DIATOMACEÆ and DESMIDIACEÆ have been proved to be forms of algæ. See these words, also, BACILLARIÆ and CLOSTERIUM. The VIBRIONINA are now included amongst the *Oscillatoreæ*, a family of compound algæ; whilst the VOLVOCINA and MONADINA are ascertained to be other forms of that large order of plants. On the other hand, many others are apparently only the larva state of annelides. The genus *Paramecium* has been ascertained to be the embryo state of *Planaria*, and *Cercaria* the undeveloped young of an intestinal worm; and, lastly, two whole families containing *Amiba*, *Arcellina*, &c., have been removed to form part of a sub-class called RHIZOPODA, or FORAMINIFERA. The greater portion of the fossil infusoria described by naturalists as so abundant in the marine and fresh water deposits, are in like manner removed from this class and placed amongst the *Diatomaceæ*.

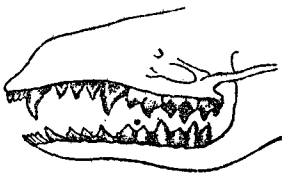
Inia.—A genus of cetacea. See DELPHINIDÆ.

Inocarpus.—A genus of plants. See THYMALEACEÆ.

Inoceramus.—A genus of extinct fossil *Mollusca* belonging to the class *Acephala*, and family *Aviculidæ*. The shells are longitudinal, inequivalve, with the umbos terminal, unequal, and more or less prominent. The species are chiefly from the cretaceous formations and from the oolite.

Insecta.—A class of animals belonging to the sub-kingdom *Annulosa*, and characterized as "Annulose animals breathing by tracheæ, having the head distinct, and provided in the adult state with six articulated legs and antennæ, subject also to a series of moultings previously to attaining perfection, whereby wings are ordinarily developed." The group of animals thus characterized is a very natural one, and corresponds to the *Ptilota*, or winged insects of Aristotle. Under the name insecta many naturalists include also the *Arachnida*, *Myriapoda*, and *Crustacea*, but as these all differ in the number of feet, as none of them have wings, as the change they undergo in their progress to maturity does not amount to such a complete metamorphosis as in the winged group, the term is now generally restricted to this latter group alone. In this group, *Insects* properly so called, the body is distinctly divided into three parts, head, thorax, and abdomen, forming altogether thirteen segments. To the head are attached two organs, composed of a number of distinct articulations, called antennæ; to the thorax are attached the feet, consisting of three pairs, and the wings, which are either two or four; and to the abdomen, which never possesses organs of locomotion, are attached various appendages which differ very much in different families. Insects are oviparous, and the larvæ, or young, are in many cases very unlike the parent, requiring several changes of form before they assume the perfect state. As the young animal increases in size, the integument becomes too small for it, it is therefore thrown off, and a new one forms. This change of skin, or moulting, takes place several times, in general at least as many as five, before the larva arrives at its full growth. At the time of the last change many insects spin a cocoon of silky fibres, others dig a hole in the ground, and in these retreats they remain to undergo their second transformation, changing there into the state of nympha, or pupa. In this stage of their existence they continue for a certain time immovable, and in a state of complete repose; and this period varies from a few days to some weeks, months, or even, in a few, to a couple of years. During this nympha state, great changes take place in the organs of the insect. These become gradually developed, till at the proper time for becoming mature, it bursts its pupa case, and comes forth a perfect insect. Insects have generally been divided into the following orders: COLEOPTERA, or beetles; ORTHOPTERA, or straight-winged insects; NEUROPTERA, or net-winged insects; HYMENOPTERA, or clear-winged insects; LEPIDOPTERA, or scaly-winged insects; DIPTERA, or flies; HEMIPTERA, or the bugs; and HOMOPTERA the siphon-mouthed insects, or plant-suckers. To these have lately been added EUPLEXOPTERA, or earwigs; THYSANOPTERA, or thrips; TRICHOPTERA, or caddice flies; STREPSIPTERA, or bee parasites; APHANIPTERA, or fleas, &c. Insects occur in a fossil state. It is only within the last few years, however, that much has been done to add to our information upon this subject. Their occurrence in marine strata is a rare one, but in the lower lias beds they occur so extensively, between the ordinary lias limestones and the bone bed, as to justify the application to this stratum of "insect limestone."

Insectivora.—An order of carnivorous quadrupeds synonymous with GLIRES, and deriving its name from the habits of the species belonging



Teeth of Insectivorous animal.

to it. They live upon insects, and their teeth are formed and adapted for eating that kind of food.

Insessores.—A name given by some naturalists to an order of birds called perching birds, and synonymous with the Linnæan order PASSERES.

Intestina. *Intestinal Worms.*—A class of animals living parasitical in the intestines of other animals. It is a synonym of ENTOZOA.

Inula.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Corymbiferæ*. Two or three species are natives of Great Britain. *I. Helenium*, the elecampane, is one, the root of which possesses stimulant and expectorant qualities. It is thick and branching, and has an aromatic bitter taste. Various preparations of the boiled root have been recommended, mixed with sugar, to promote expectoration, and to strengthen the stomach. It contains a white amylaceous matter called *Inulin*.

Invertebrata.—One of the grand divisions of the animal kingdom, characterized by having no spinal column, and containing the MOLLUSCA, ARTICULATA, and RADIATA.

Iolite (ἰον, a violet; λιθος, a stone).—A mineral substance of a blue colour, and vitreous translucent lustre, and occurring in masses, or in regular six-sided prisms. Its specific gravity is 2·5969 to 2·6643, and it is composed of silica, alumina, and magnesia, with a little protoxide of iron, and a trace of protoxide of manganese. Iolite is found at Cape de Gata, in Bavaria, Greenland, and Norway. It is occasionally employed as an ornamental stone, and when cut, presents different shades of colour, from which circumstance it has received the name of *Dichroite*. *Hydrous Iolite*, is iolite altered by exposure to air and moisture. It then absorbs water, and assumes a foliated micaceous structure resembling talc.

Ione.—A genus of *Crustacea*. See ISOPODA.

Ionia or **Ionidium.**—A sub-genus of plants, separated by some botanists from the genus *Viola*, and containing several species natives of South America, the roots of which have emetic properties, and are frequently substituted for the true ipecacuanha.

Ipecacuanha.—The root of several plants, mostly natives of South America. The brown and gray ipecacuanha is the produce of *Cephaelis Ipecacuanha*—see CEPHAELIS. The white ipecacuanha is procured from a plant of the family *Violaceæ*, *Ionidium* (*Viola*) *Ipecacuanha*, a native of Brazil and Cayenne. This kind of ipecacuanha is not imported to any extent to this country, but it is greatly used by the natives of South America as a remedy in dysentery. The striated or black Peruvian ipecacuanha is obtained from the roots of *Psychotria emetica*, a plant belonging to the nat. ord. *Rubiaceæ*, and a native of New Grenada, along the river Magdalena. This plant is an undershrub, with a straight stem, hairy, almost cottony, and having the root branched and striking vertically down into the ground. This kind of ipecacuanha is not much brought into the market. The amylaceous ipecacuanha is furnished by *Richardsonia scabra*, or *braziliensis*, a plant belonging to the nat. ord. *Rubiaceæ*, and a native of the provinces of Rio Janeiro, and Minas Geràes. In all these plants the virtues they possess depend upon the presence of an alkaloid, called *Emetine*.

Ipomæa.—A genus of plants containing amongst other species the sweet potato. See CONVOLVULACEÆ.

Iriartea.—A genus of palms containing two or three species, one of which, the pashiuba miri as it is called by the Indians, *I. setigera*, is a native of the banks of the upper Amazon, and Rio Negro. It grows to a height of from fifteen to twenty feet, and has a slender stem of the thickness of from a man's finger to that of his wrist. This palm is of the greatest importance to the Indian of the Rio Negro. Of its stem he constructs his *gravatana*, or blowing tube, which with the little arrows made from the spines of the potawa, forms a most valuable weapon, enabling him to bring down monkeys, parrots, and curassow birds from their favourite stations on the summits of the loftiest trees of the forest. These tubes are from eight to ten or twelve feet long, and beautifully smooth inside. When birds are feeding at the top of a lofty tree, where the result of a gun shot would be doubtful, a skilful Indian, with a puff from his powerful lungs, will send up his little poisoned arrows with unerring aim.

Iridaceæ. *The Iris family.*—A nat. ord. of monocotyledonous plants, composed of numerous species of herbs with largely developed rhizomes, or what are commonly called bulbous roots. Their leaves are generally ensiform, or linear, and those of the stem are sheathing at the base. Their flowers are accompanied with a spathe usually formed of two bracteæ, and their perianth is formed of six coloured portions, petaloid, and of lively colours, united inferiorly into a tube. The irids are not very common in intertropical climates, but are numerous in the warm and temperate parts of the world out of the tropics, being in some particular places exceedingly abundant, and, as at the Cape of Good Hope, giving a peculiar character to the vegetation. A number of the genera are well defined in their geographical dis-

tribution. The *Iris*, for instance, is confined to the temperate parts of the northern hemisphere. The *Crocus* belongs to Europe and the temperate parts of Asia. *Pardanthus* is confined to tropical Asia, and all the genera found at the Cape are restricted to that part of the world. Those again found on the west coast of North America are exclusively confined to that region. The rhizomes of several of the genera of iridaceæ are useful to man, as affording substances employed by him in medicine, or for economical purposes. The stigmata of the crocus, for instance, afford the substance known as saffron—see CROCUS. But it is as ornamental plants that this family are best known, many of them being of great beauty, and sporting into numerous varieties. It contains upwards of 50 genera, and 550 species. The genus *Iris* is the type of the family, and gives it its name. It contains a good many species which are highly esteemed as ornaments for the garden, their flowers being usually large and variously coloured. Some of the species are useful as medicinal agents. The Florentine iris, *I. Florentina*, is a native of the south of Europe and the islands of the Mediterranean, and is remarkable for its fine large white flowers, the petals being two inches long and one inch broad. The root has the perfume of the violet, and is a good deal used as a dentifrice. It is imported to us from Italy, Florence especially, and is known in the shops by the name of orris root. It enters into the composition of Ruspini's tincture and tooth powder, and was at one time used in medicine. The fresh root administered internally acts as a purgative, emetic, and diuretic, and when dried and turned into small balls, is used externally as issue peas. *I. germanica* is a fine species with large and handsome violet flowers. It is much cultivated in gardens, and its root is larger than the last, and possesses the same qualities, only in a more active degree. *I. pseudacorus*, the yellow flag, is a common native of Great Britain, has handsome yellow flowers, and its root contains properties even more powerful than those of either of the others. It possesses a considerable degree of astringency, in consequence of which it is used in some places for making ink, and in others for dyeing black. The seeds, when roasted, are said to be a good substitute for coffee; and in some parts of Scotland the leaves are used by coopers, being put between the steps of barrels to prevent leakage. *I. fœtidissima*, the stinking flag, is also a native of Great Britain, as well as other parts of Europe. Instead, however, of having a fetid odour, it has the smell of roast mutton, and is called in France, where it is common, "iris à odeur de gigôt". The flowers are of a dirty reddish colour, and the root and seeds are purgative, and are used by the native peasants for this purpose.

Iridium.—A metal. See PLATINUM.

Iris.—See IRIDACEÆ.

Isatis.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and containing two or three species which yield a blue dye similar to indigo. *I. tinctoria*, the woad, is a native, though rare, of Great Britain, and before the introduction of indigo, was a plant of considerable importance. The blue dye obtained from it was long known and used in this country, and it was with it that the ancient Britons were said to paint their bodies. The town of Glastonbury, in Somersetshire, derives its name from the Celtic word "glas," which signifies blue, and it was in the neighbourhood of this town that this plant used to be extensively cultivated. *I. indigotica* furnishes the *Tein-Ching*, or Chinese indigo.

Isis.—A genus of zoophytes belonging to the family *Coralliidæ*. In the species of this genus the calcareous matter is only deposited in certain parts of the axis, leaving the rest simply formed of the horny animal matter. The axis looks as if it were jointed, the stony and horny parts easily separating from each other when the mass of the animal has been removed.

Isocardia (ἴσος, like; καρδία, the heart). *The Heart Cockle.*—A genus of bivalve shells belonging to the family *Cyprinidæ* of some authors, or, according to others, forming the type of a separate family *Isocardiidæ*. The shells of this genus are large and very globular, not thick, and the umbos are much curved toward the anterior side. The animals burrow in the sand by means of their foot. Only five species are described as recent, but seventy fossil species have been enumerated.

Isoetes (ἴσος, equal; ἔτος, the year). *The Quill Worts.*—A genus of acotyledonous plants belonging to the nat. ord. *Lycopodiaceæ*, consisting of plants usually of small size, growing at the bottom of ponds and lakes, and affording, it is said, excellent food for fish. *I. lacustris*, the common quill wort, is a British species, and grows in mountain lakes. It is remarkable in its mode of growth, possessing a stem which never branches, and roots, the youngest of which are the lowest, the oldest being gradually pushed upwards and outwards towards the circumference.

Isonandra. — A genus of dicotyledonous plants belonging to the nat. ord. *Sapotaceæ*, and distinguished by the stamens being all fertile, and twice as numerous as the lobes of the corolla. *I. gutta*, the gutta percha tree, is a native of Sumatra and the Malayan Archipelago, and yields a milky juice, which, when inspissated, becomes the substance so well known of late years as *Gutta Percha*. Each tree will yield from twenty to thirty lbs. This valuable product possesses many of the qualities of india-rubber, and being capable of becoming soft without adhering, by means of a heat of boiling water, and regaining, on cooling the elasticity and consistence of leather, admits of being applied to a great many uses to which india-rubber is not adapted. It is capable of taking and retaining the most delicate impressions, and from this circumstance, and from being soluble

in oil of turpentine, oil of tar, ether, &c., and admitting of being vulcanized with sulphur, has been already very much used in the arts. Indestructible by water, and being a bad conductor of electricity, gutta percha has lately been found of great service in forming a case for the

Isonandra gutta—The Gutta Percha Tree.

metallic wires forming the electric telegraph. Soles of shoes impervious to water, ropes, straps, casts of various kinds, &c., &c., are made of this substance in great variety; and no doubt the important uses to which it has been applied are only the forerunners of those to which it will be adapted hereafter. In 1845, soon after public attention had been directed to this article of commerce, 20,600 lbs. were imported to this country. In 1848, this quantity had increased to above 3,000,000 lbs., and it has since gone on increasing.

Isopoda (*ισος*, equal; *πους*, a foot).—An order of *Edriopthalmous*, or sessile-eyed *Crustacea*, containing many species widely distributed. The feet are seven pairs, almost always terminated by a somewhat sharp and often more or less prehensile claw. The abdomen has six pairs of members attached to its segments called false feet, each pair having at their extremities two large oval, more or less membranous plates, which form the branchiæ, or gills, and serve the purpose of respiration. The females carry their eggs under the thorax, in a pouch attached to the base of the feet. They are retained there till the young are hatched, and the mother then opens the pouch and allows them to escape. Some of the species belonging to this order have the feet fitted chiefly for walking. Of these walking isopods, the sea centipedes, *Idotea*, are remarkable for having the sixth pair of false feet broad and lamellar, and forming a large cover which protects the cavity where the branchial feet are lodged. The sea wood lice, *Asellidæ*, have them on the contrary styliform, and prolonged beyond the abdomen in form of a tail. The species of the genus *Asellus* are natives of fresh water, are very abundant in all parts of Great Britain, and are popularly known by the name of *Screws*. Other species are marine, and are very destructive to timber—see LIMNORIA. The wood lice, *Oniscidæ*, have the sixth pair of feet also styliform, and never covering the branchial feet. Some of these are marine entirely, forming the sub-family *Lygiidæ*, or fork-tailed sea lice, living near the edge of the sea in stony or rocky situations above high water mark, and possessing the power of rolling themselves in the form of balls, and when alarmed allowing themselves to drop suddenly. Others are essentially terrestrial, the *Oniscidæ* proper, or true wood lice. In these the branchial feet perform the part of true lungs, for they enclose within them hollow organs, into the interior of which atmospheric air can penetrate directly through openings variously disposed. They are thus formed exclusively to live on dry land. The species of the genus *Oniscus* inhabit gardens, old walls, cellars, caves, and other damp places. They feed upon decayed animal and vegetable matter, and only come forth in damp and moist weather. They crawl but slowly at first when not alarmed. The young are not perfectly formed at birth; they want one of the thoracic segments, and of course a pair of legs, which, however, they acquire in their progress to maturity. Another group of the *Isopoda* have their feet more or less adapted for swimming, and the last segment of the abdomen forms with the horizontal plates with which the sixth pair of false feet are terminated, a large caudal fin. Of these swimming isopods, the pranizians, *Praniza*, which have only five rings to the thorax, and five pairs of feet, are in part parasitical, the males living on rocks, whilst the females are always attached to the branchiæ of different fishes. The sphæromians, *Sphæroma*, which have the feet formed for walking, but have the large natatory caudal fin, live on rocks on the sea coast, and have the faculty of rolling themselves up in the form of a ball when touched or alarmed. They are all of small size,

and several species are found in this country. The fish lice, *Cymothoa*, which have their feet formed for holding fast any body which they seize, are all more or less parasitic upon fishes; some preserving the power of walking with facility, whilst others become almost immovable. Of those which retain the power of walking, the genus *Serolis* is remarkable for the general resemblance the species bear to the extinct fossil *Trilobites;* whilst of those which fix themselves truly parasitically upon the bodies of fishes, the genus *Cymothoa* is perhaps the best known, and is called the sea louse by fishermen on the coast. The young of these animals undergo considerable changes of form in their progress from youth to maturity. When old they show a tendency to become deformed, and sometimes grow to the length of nearly three inches. In a third group of *Isopoda*, the sixth pair of false abdominal feet are altogether wanting, and their mouth is formed more for suction than for mastication, as the jaws, which all the other malacostraca have, in these are not in existence. They thus seem to establish the transition from the *Edriopthalmi* to the *Siphonostoma*. They are completely parasitical. Some of them, as the tailed crab lice, *Ione*, live in the branchial cavity of the land crab of Jamaica. The males are exceedingly small, and the females, which are much larger, are only three lines long. Others, as the tailless crab lice, *Bopyrus*, live fixed under the vault of the branchial cavity of the prawns, shrimps, &c., where they may be detected forming a small tumour. The males are five or six times smaller than the females, and are found attached to their abdomen. The young, when first born, resemble very much the young of the genus *Cyclops*, and undergo considerable changes before they arrive at maturity.

Isopyre (*ἴσος*, equal; *πυρ*, fire).—A mineral of a velvet-black colour, with red spots like heliotrope, found imbedded in granite, in Cornwall, in small amorphous pieces. It has a specific gravity of 2·912, a conchoidal fracture, and a vitreous lustre, and is composed of silica, alumina, lime, and peroxide of iron, with a small quantity of oxide of copper.

Iulidæ.—A family of *Myriapoda*. See CHILOGNATHA.

Iulus.—A genus of

Ixia.—A genus of monocotyledonous plants belonging to the nat. ord. *Iridaceæ*, and containing upwards of 100 species of bulbous-rooted plants, natives, for the most part, of the Cape of Good Hope. They are slender stemmed plants with ensiform leaves, and generally speaking large and brilliantly coloured flowers. Many of the species are cultivated in our gardens and conservatories.

Ixodes (*ἰξώδης*, viscous).—A genus of mites forming the type of the family *Ixodidæ*. See ACARIDÆ.

J

Jacare.—A genus of saurian reptiles. See CROCODILIDÆ.

Jacchus.—A genus of monkeys belonging to the family *Cebidæ*, or American monkeys, and containing several species, all natives of South America. *J. vulgaris*, the striated monkey, marmozet, or ouistiti, is one of the best known. This species is about eight inches long, with a far of an olive-gray colour, and it has the tail rather more than eleven inches in length, full and handsome, and, along with the lower part of the back, barred or annulated with pale gray. Two tufts of pale hair, springing round the ears, give it a peculiar appearance. It is a native of Guiana and Brazil, and appears to be omnivorous, feeding on fruits, roots, seeds, insects, and little birds or nestlings.

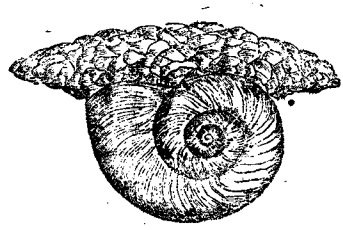
Jade.—A name given to several minerals very different from each other. Common jade is a variety of *Nephrite* or serpentine. Oriental jade is a compact *Tremolite;* and the yu, or Chinese jade, is supposed to be *Prehnite*.

Jambosa.—A genus of plants. See EUGENIA.

Jania.—A genus of calcareous *Algæ* belonging to the family *Corallinæ*. They are of a greenish-violet or red colour, when fresh, but soon become white, when exposed to the light. The species are abundant on European coasts, forming tufts upon other marine plants, about an inch or two high.

Janipha.—A genus of plants, to which the *Manihot* is now referred. See JATROPHA.

Janthina (*ἰανθινος*, violet). *The Violet Shells.*—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of a small family, nearly allied to the *Haliotidæ*. The shells are always of a fine violet-blue colour, and the animals secrete an abundance of violet



Janthina vulgaris—Violet Shell.

coloured fluid, which they exude when handled, from beneath the margin of the mantle. They resemble the pteropods in their habits, for they are found gregarious in the open sea, suspended from the surface of the water by a float, consisting of numerous cartilaginous air vessels, to the

under surface of which the egg capsules are attached. They appear often in myriads, and are said to feed on the small blue acalephæ, called *Velellæ*. They do not appear to have the power of sinking and rising in the water, and their float is considered by some naturalists to represent an extreme modification of the operculum. Six species are described, all oceanic—though, when the float becomes detached, the empty shells are frequently drifted from the Atlantic and thrown upon the coasts of Great Britain.

Jasminaceæ. *The Jasmine* or *Jessamine family.*—A nat. ord. of dicotyledonous plants, containing several genera and species, most of which are natives of the warmer climates of the Old World, only a very few being found in America. They are trees or shrubs, generally twining, and having sweet scented flowers. The species of the genus *Nyctanthes* only blow at night. *N. arbor tristis* is a native of tropical Asia, but is cultivated in our gardens. The flowers are yellow, and only give out their agreeable odour as the night sets in. *Jasminum* is the type of the family, and there are several species which are well known in our gardens as favourite climbing shrubs. Some of them have yellow flowers, others white, and all possess a sweet scent, the flowers containing a quantity of volatile oil, upon which the odour depends. The common jasmine, *J. officinale*, though considered by some botanists to be originally a native of the coast of Malabar, in India, is now perfectly naturalized in the south of Europe, and has been a favourite wall-shrub from time immemorial. The flowers are small and white, and possess a very agreeable odour. The plant has been used in medicine as an antispasmodic, but is now only employed by the perfumer. *J. grandiflorum* is known by its large flowers, white within and purple without. It is a native of India, and much resembles the common jasmine. The flowers are equally odoriferous; and it is from this and the preceding species that the true essential oil of jasmine of the shops is obtained. *J. angustifolium*, narrow-leaved jasmine, a native of the Coromandel coast, has large, white flowers, with a faint tinge of red, and a very agreeable scent. It is a twining, bright plant, clothed with leaves of a shining, deep green, which render it well adapted for screening windows and covering arbours. The root is bitter; and the natives of India use it, ground small and mixed with powdered *Acorus calamus* root, as an external application in cases of ringworm. *J. fruticans*, a native of the southern parts of France and other parts of Europe, and of the Levant, and *J. odoratissimum*, a native of India, have yellow flowers, of a sweet odour, which in the latter species resembles that of the jonquil. The essential oil of jasmine is also obtained from this species, and from the single-flowered Arabian jasmine, *J. sambac*, a native of India, possessing white and fragrant flowers, and globular black berries.

Jasminum.—*The Jasmine.* See JASMINACEÆ.

Jasper.—A mineral substance a good deal used by the lapidary. It is a variety of quartz, and is of a deep brown, yellow, or red colour, and a resinous lustre. Its specific gravity is 2·6. Brown coloured jasper is abundant in Egypt, and is hence generally called *Egyptian jasper*. Jasper appears to be coloured by iron; and when stripes of green, yellow, or red occur on the same mineral, it is called *striped jasper*.

Jatropha.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and containing several species which possess considerable medicinal properties. *J. curcas*, the physic nut, a small tree or shrub, is common in India, on the Coromandel coast. The leaves, which are broad, cordate, smooth, and about six inches in length and breadth, are considered as discutient. Warmed and rubbed with castor oil, they are applied by the natives of India as poultices. The seeds are violently emetic and drastic, and in large doses prove energetic poisons. The milky juice dyes linen black, and the expressed oil of the seeds, boiled with oxide of iron, forms a varnish used by the Chinese for covering boxes. The seeds of *J. multifida*, a native of tropical America, form an excellent emetic and purgative, acting briskly, but without inconvenience; and the expressed oil of the seeds of *J. glauca*, a native of Arabia Felix, is stimulating, and is used by the natives of India as an external application in cases of rheumatism and paralytic affections. From the *J.* (*Janipha*) *manihot* is obtained the article of food so much used in the West Indies and South America, known by the name of cassava. See CASSAVA. The root of this plant is an oblong tuber, as big as a child's head, and full of a wheyish juice, which is dangerously poisonous. Tapioca is another substance obtained from the root of this plant.

Jerboidæ.—A family of mammiferous quadrupeds belonging to the order *Glires* or *Rodentia*. The animals belonging to this family have only two cutting teeth in each jaw, their eyes are large and prominent, their tail long, hairy, and used in leaping or walking, and their hind feet are much longer than their fore feet, which are short, and often used as hands. The family contains a considerable number of species, which are arranged in sub-genera, as the leaping hares (see PEDESTINA), the chinchillas (see CHINCHILLIDÆ), the jerboas (see DIPUS), the dormice (see MYOXUS), and the squirrels (see SCIURIDÆ).

Jonesia.—A genus of dicotyledonous plants named after the celebrated Sir W. Jones, and belonging to the nat. ord. *Leguminosæ*, sub-order *Cæsalpineæ*. The species are Indian, grow to the height of considerable sized trees, and are very showy when in flower. The asoca, *J. asoca*, is a favourite of the Hindoo poets, and is described as being, when the crowded racemes of flowers are in full blossom, one of the most

beautiful objects afforded by the whole vegetable kingdom.

Jonidium.—A genus of dicotyledonous plants belonging to the nat. ord. *Violaceæ*, and containing several species, one of which, *J. ipecacuanha*, furnishes the article known as the white ipecacuanha. See IPECACUANHA.

Juglandaceæ. *The Walnut family.*—A nat. ord. of dicotyledonous plants, containing a number of species, some of which are natives of the temperate and tropical parts of Asia, while others (and the greater number) are natives of America. They are all trees of considerable size, and several are cultivated in Europe, one indeed so much that it has almost become naturalized. The leaves of these trees exhale an agreeable odour, and the fruit of some is much used as a wholesome article of food, and for supplying a valuable oil. The genus *Juglans* is the type of the family, and gives it its name. *J. regia*, the common walnut, is a native of Persia, and is a handsome, large tree, with a thick, massive trunk, covered with a deeply furrowed bark, and dividing at the top into numerous, strong, spreading branches. Its large, glabrous, deep green leaves, which exhale an aromatic odour when crushed, give it a fine appearance, whilst its fruit renders it valuable as affording an article of food. The mesocarp or external covering of the fruit is a fleshy husk, containing underneath a hard, rugose nut, with a sweet kernel, consisting of one grain, divided into four lobes. In many parts of France, Spain, Germany, and Italy, people live during the season of their ripening almost entirely on walnuts. Great quantities are brought to this country. In 1831 not less than 23,578 bushels were imported, nearly the whole of which were retained for home consumption. When young, great quantities are pickled, and form a considerable article of trade. The walnut has been cultivated in Europe for a great length of time, and appears to have been introduced into Italy in the time of the Emperor Tiberius. The wood of the tree is much esteemed by carpenters and cabinetmakers, and, before the introduction of mahogany and rosewood, was preferred in this country to any other for articles of furniture. At the present time fashion has again introduced walnut wood, and it is now extensively manufactured into articles for the drawing-room and bedroom. A very important use to which it is applied is the making of musket stocks, for which purpose it is well adapted from its lightness, strong lateral adhesion, and its not being liable to split or warp in the working. The wood of the root is most beautifully veined, and, as well as the husk of the fruit, yields a dye which is much used by gypsies and theatrical performers for staining the skin brown, and by cabinetmakers and joiners for staining white and yellow woods of a dark brown or black colour, like that of the walnut itself. The sap of the tree contains saccharine matter, and a spirit is distilled from it. From the kernels there is obtained, by expression, a valuable oil, which, when cold drawn, is used on the continent for the purposes of diet, and when obtained by heat, is used by artists and for burning in lamps. The black walnut tree, *J. nigra*, is a native of North America, and attains a height of from fifty to sixty feet. The fruit is large, but not equal in flavour to that of the common walnut. The wood, however, is well adapted, from its power of resisting the action of water and alternations of drought and moisture, for building piers and for other naval constructions. The gray walnut or butter nut tree, *J. cinerea*, a tree fifty or sixty feet high, is a native of North America also, and obtains its latter name from the kernels of the fruit being thick and oily, and soon becoming rancid. The wood is useful, and the bark possesses considerable medicinal powers, and is used in the United States as a purgative, and as an application in toothache. The leaves are so acrid that they are employed, when powdered, as a substitute for cantharides. The hickory tree belongs to this family. See CARYA.

Julis.—A genus of acanthopterygious fishes belonging to the family *Labridæ*. A number of species are contained in this genus, distinguished by their lateral line being uninterrupted, the dorsal fins furnished with stiff and sharp spines, and the head being destitute of scales. Their teeth in front are conical and strong, and fitted for crushing mollusca and echini, upon which they feed. Their colours are very brilliant, many of them, though inhabiting the Mediterranean, rivalling in splendour the natives of tropical climes. About eighty-eight species are known, the most common, perhaps, of which is *J. vulgaris*, or the rainbow wrasse, remarkable for its varied colours, consisting of orange, blue, yellow, and silver. The flesh is white and good eating. It is a common fish at Nice, and specimens have been taken off the coast of Cornwall.

Juncaceæ. *The Rush family.*—A nat. ord. of monocotyledonous plants, composed of numerous species of herbaceous plants with fasciculated or fibrous roots, nodose stems, and hollow, grooved or flat leaves, sheathing the stem at the base. They are natives of almost all parts of the world, though chiefly of the colder regions. Under the equator they occur only as alpine plants, and in northern climates they are chiefly found in marshes. This family contains thirteen or fourteen genera, of which the most important and the one containing the greatest number of species is the genus *Juncus*, or rush. Upwards of 100 species of this genus are described, inhabiting moist places in the temperate and cold parts of the globe. The leaves are generally cylindrical and sharp pointed, and grow in great numbers and in thick tufts. Two or three species, as *Juncus effusus*, *conglomeratus*, and *glaucus*, are considered to possess diuretic qualities, and are used for this purpose by the peasants of Germany. The long leaves of many of the species are used

for tying plants in gardens, and for making the bottoms of chairs, mats, &c. The central cellular tissue or pith is often employed for making wicks for lamps and rush-lights. Rushes are also useful in marshy grounds for fixing the soil, and for forming banks on the edges of canals, &c.

Juncus. *The Rush.*—See JUNCACEÆ.

Jungermanniæ. *Scale Mosses.*—A sub-order of acotyledonous plants belonging to the nat. order *Hepaticæ*, and somewhat resembling mosses in appearance. They inhabit the trunks of trees, damp earth, or even the young shoots and leaves of other plants in hot, moist climates. Some have the stem and leaf formed into a frond or thallus, resembling that of a lichen, but more commonly the species have leaves with stipules at their base. A great many genera have of late been formed out of the old genus, *Jungermannia*, which, as it formerly existed, contained upwards of 300 species, chiefly natives of Europe and America.

Juniperites.—A genus or group of fossil plants belonging to the nat. ord. *Coniferæ*. The leaves of these plants are similar to those of the juniper and cypress, and the plants themselves are found in the lignites.

Juniperus. *The Juniper.*—A genus of gymnospermous dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Cupressineæ*, and containing about twenty species of hardy, evergreen, woody plants with narrow, sharp pointed leaves, and fruit composed of scales representing carpels spread open, and collected in a spiral manner round a common axis. This fruit or berry, or *galbule*, as it is botanically termed, is fleshy when ripe, and in some species not unpleasant to the taste. About twenty species are known. *J. communis*, the common juniper, is a common bush in all the northern parts of Europe and North America, and is said to grow in the north of India. The fruit is diuretic, and is used in large quantities in the manufacture of the spirituous liquor called Hollands or gin. On distillation with water, the berries yield a volatile essential oil, very subtle and pungent, and in smell greatly resembling the berries. The French name for this plant is *Genevre*, and hence our English words "gin" and "Geneva." *J. sabina*, the *Savin*, forms a compact, gloomy looking bush, and is found growing wild in the middle of Europe and the west of Asia, inhabiting the most sterile soil. The young branches and leaves contain an active volatile oil, which is used as an anthelmintic and emmenagogue. In large doses it acts as a violent irritant poison; and from a belief that it acts as a powerful uterine stimulant, it is often used criminally for the purpose of procuring abortion. It seldom produces the effect, but often causes fatal consequences to those who take it. When applied externally, the oil of savin produces blisters on the skin. *J. Virginiana*, the red cedar, is a large bush, and even in some situations a considerable sized tree. It is a native of North America, and its timber is of great excellence and durability. An oil is obtained from it which is used as a rubefacient. *J. Bermudiana*, the Bermuda red cedar, is a large tree, and is a native of the Bermudas. The wood is soft and fragrant, and is what is used for making pencils. It is also much used by cabinetmakers.

Justicia.—A genus of plants. See ACANTHACEÆ.

K

Kæmpferia.—A genus of monocotyledonous plants belonging to the nat. ord. *Zingiberaceæ*, or *Scitamineæ*, and named after the celebrated botanist, *Kæmpfer*. The species are herbaceous, with tuberous roots, and their flowers are curious and elegant. They appear to spring from the root, are generally grouped in fours or fives, or more, and are accompanied with bracteæ, some of which are large, external, and common to several flowers. They are natives of India and its archipelago, and some of them are cultivated in gardens for their beauty and fragrance. The tubers which accompany the roots are feculent and aromatic. The substances called *Zedoary* and *Galanga* were supposed by some botanists to be produced by two species of the genus, but incorrectly. The root of *K. Galanga*, which is a native of the mountainous regions beyond Chittagong, is used by the Hindoos to mix with their betel.

Kalmia.—A genus of dicotyledonous plants belonging to the nat. ord. *Ericaceæ*, and comprising a number of handsome shrubs, with evergreen leaves and rose coloured flowers, and in consequence often cultivated as ornaments of the garden. They are natives of North America, and are remarkable for the irritability of their stamens.

Kammererite.—A mineral found in the Ural mountains, and composed of silica, alumina, and magnesia, with a little lime and oxide of chromium. It occurs crystallized in violet-red six-sided prisms. Specific gravity 2·76, lustre pearly. It is allied to serpentine.

Kancelstein.—A mineral. A synonym of GARNET.

Kangarus.—*The Kangaroo.* A synonym of MACROPUS.

Kaolin.—An argillaceous earth. The Chinese term for porcelain clay. See FELSPAR.

Karpholite (*καρφος*, straw; *λιθος*, stone). *Straw Stone.*—A mineral found in granite in Bohemia, of a straw colour, and disposed in silky, radiating fibres. It is composed of silica, alumina, oxide of manganese, and oxide of iron, with a little lime and fluoric acid. Specific gravity, 2·935.

Karphosiderite.—A yellow resinous mineral found in mica slate in Labrador. Specific gravity 2·5. It is a hydrous phosphate of iron, and is of a pale or bright straw-yellow colour.

Katherina.—A genus of chitons. See CHITONIDÆ.

Kermes.—See COCCIDÆ.

Kermes Mineral.—A brick-red powder obtained from antimony, and not occurring in nature.

Kerodon (*κέρας*, a horn; *ὀδούς*, a tooth).—A genus of animals belonging to the order *Glires* or *Rodentia*, family *Hystricidæ*, and sub-family *Caviina*. Two recent species and two fossil have been found. See CAVIA.

Kerolite.—A mineral found in Silesia, along with serpentine. It is of a white or green colour, transparent, of a greasy feel, and vitreous or resinous appearance. Specific gravity 2.

Kerona (*κέρας*, a horn).—A genus of minute animals belonging to the class *Infusoria*. The body is covered with hairs, some of which on the inferior surface are thicker and shorter, and curved like horns, hence the name. These serve as organs of progressive motion, the animal being enabled to creep with them on solid bodies. They are found in vegetable infusions, and fresh stagnant water in which vegetable matters have been long standing. When numerous they are visible to the naked eye, looking like dust floating in the water. They are very voracious, feeding upon smaller infusoria than themselves, small algæ, &c.

Khaya.—A genus of dicotyledonous plants belonging to the nat. ord. *Cedrelaceæ*, and containing only one species, *K. Senegalensis*, one of the largest and handsomest trees of Western Africa. It attains a height of from 80 to 100 feet, and is one of the most common trees on the banks of the Gambia and in the valleys near Cape Verd. The wood is of fine quality, and of a reddish colour like mahogany, and the bark is very bitter, and is used by the natives in the form of infusion or decoction in cases of fever.

Klaprothite.—A mineral substance, named after the celebrated chemist *Klaproth*, and synonymous with LAZULITE.

Knowltonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*, and containing five or six species of perennial herbs, natives of the Cape of Good Hope. The leaves of *K. vesicatoria* are used at the Cape as vesicants.

Kobus.—A genus of antelopes. See ANTILOPEÆ.

Kolpoda (*κόλπος*, a notch).—A genus of minute animals belonging to the class *Infusoria*, found in stagnant fresh water and in vegetable infusions. They are characterized by their bodies being notched laterally, and having their mouth situated at the bottom of the notch. The body is marked with five oblique cross striæ, and is furnished with rows of very fine vibratile cilia.

Krameria.—A genus of dicotyledonous plants belonging to the nat. ord. *Polygalaceæ*, and consisting of several species, which are spreading, many-stemmed under-shrubs. *K. triandria* is a native of Peru, and yields the substance known as rhatany root. The root is horizontal, very long, and branched, and is used as a powerful and pure astringent in cases of hemorrhage and chronic mucous discharges. The powder is much used in Peru as a dentifrice.

Kyanite or **Cyanite.**—A mineral found in primitive rocks and in mica slate in Switzerland, Scotland, and in America. It is composed of silica, alumina, and water, and occurs crystallized and massive, its primary form being a doubly oblique prism. Specific gravity, 3·6.

L

Labeo (*labium*, a lip).—A genus of malacopterygious fishes belonging to the family *Cyprinidæ*, and containing several species characterized by their having very thick and fleshy lips. They are exotic fishes, belonging to the Old World, chiefly inhabiting the Nile and the rivers of India. The type of the genus is *L. Niloticus*, which is of a brownish colour, with a greenish tint on the edges of the scales. It is the most common fish found in the Nile, and the flesh is much esteemed by the Arabs.

Labeobarbus (*labium*, a lip; *barba*, beard).—A genus of malacopterygious fishes belonging to the family *Cyprinidæ*. The species are distinguished by having thick lips, to the interior of which is attached a fleshy appendage prolonged in the form of a beard. Three or four species are known, one of which, *L. Nadgia*, is found in the river Nile. The back and head are of a fine yellowish-green colour, and the belly of a clear sulphur-yellow. It grows to a considerable size, and the flesh is eaten, and is said to be very good.

Labiatæ (*labium*, a lip).—A nat. ord. of dicotyledonous plants, deriving its name from the shape of its flowers, and forming a very natural order. The species are chiefly herbs, or at the most only under-shrubs, and are distributed over the greater part of the globe, though most abundant in the warm parts of the temperate northern zone, or upon the mountains within the tropics, where the temperature is reduced to a corresponding degree. A great portion of the species are odoriferous, owing to the leaves and herbaceous parts of the plants possessing numerous small reservoirs full of an essential oil. Such are the thyme, lavender, mint, rosemary, &c. From many of them this oil is extracted in sufficient quantities

to form considerable articles of commerce. A kind of camphor is also found in some of them associated with this volatile oil. None of the species are poisonous or injurious, and very few are used as ordinary food; though from the roots of one or two, as *Stachys palustris*, a quantity of fecula is obtained which is used as an article of subsistence. Many of them are used as grateful condiments, as marjoram, sage, basil, savoury, &c.; and others are employed medicinally as carminatives, warm stimulants, and antispasmodics, as peppermint, penny-royal, lavender, &c. The plants of this order are very numerous, not fewer then 125 genera and 2,350 species having been described. Many of the genera contain well known plants, such as MENTHA, LAVANDULA, SALVIA, ROSMARINUS, ORIGANUM, MELISSA, LAMIUM, NEPETA, SCUTELLARIA, &c., &c.

Labiatifloræ.—A division or section of the large natural order of plants *Compositæ*, the compound flowers, formed by De Candolle, and adopted by many botanists. In this section the flowers are mostly hermaphrodite, and the corolla is divided into two lips.

Labradorite. *Labrador Felspar.*—See FELSPAR.

Labrax.—A genus of acanthopterygious fishes belonging to the family *Percidæ*, and being nearly allied to the true perches. The species are known by the name of basse, and one of them, called also the sea dace, *L. lupus*, is not uncommon on the shores of Great Britain. It is a fish from twelve to eighteen inches in length, the upper parts of the body being of a dusky blue, and the sides and belly of a silvery-white. Another species occurs in the American seas, called the striped basse, or rock fish, *L. lineatus*, of a larger size, and marked with seven or eight longitudinal black lines on a silver coloured ground.

Labridæ, Cyclo-labridæ (*labrum*, a lip).—A family of fishes belonging to the order *Pharyngognathi*, and distinguished by having an oblong body, covered with scales of a large size, a single dorsal fin, supported in front by spiny rays, and most frequently furnished with a membranous appendage. The jaws are covered with thick fleshy lips, and the pharyngeals are all armed with teeth. The family contains several genera, and abounds in beautifully coloured and handsome fishes. The type of the family is the genus *Labrus*, which contains several species of an elegant and regularly oval form, and adorned with fine colours; yellow, green, blue, and red, forming spots or bands which shine with metallic lustre. They are known by the name of wrasse, are abundant in the Mediterranean and Atlantic Oceans, keep together in considerable numbers, and live upon echini, mollusca, and crustacea. Their flesh is white and good, and much valued as an article of food. About twenty-one species are known, all highly coloured, of which about six are found on the British coasts. Several other genera contain fishes which are well known. See CRENILABRUS and JULIS. The genus *Gomphosis* is remarkable for its very long and slender muzzle; and the genus *Scarus*, the parrot fishes, is distinguished by the convex and rounded form of the jaws. See SCARUS.

Labrus.—See LABRIDÆ.

Labyrynthibranchidæ (λαβυρινθος, a labyrinth; βραγχια, gills).—A family of acanthopterygious fishes, synonymous with *Anabantidæ*, and characterized by the upper pharyngeal bones being furnished with leaf-like folds, enclosing cavities capable of retaining water, and which have been compared to the leaflets of a camel's paunch. This apparatus is covered by convex gill covers that fit closely to the shoulders; so that even when the fish is out of the water, the enclosed liquid cannot evaporate quickly, but remains falling drop by drop on the branchiæ or gills, keeping them sufficiently moist to carry on the oxygenation of the blood. See ANABAS, and figure there annexed of this peculiar apparatus, where also the habits of *A. scandens*, or the tree climber, is described. Another genus belonging to the same family, *Macropodus*, contains a species, a native of the fresh waters of some of the eastern islands, as Pulo-Penang, &c. This fish, *Macropodus pugnax*, is reared for sport by the people of Siam. It seems to be a most pugnacious creature; and advantage is taken of this habit by the government of Siam to add a considerable annual revenue to the king by granting licenses to exhibit fish-fights. It appears that these fishes, when alone, and in a state of quiescence, are of dull colours, but when two are brought together, or even if one sees its own image in a looking-glass, they become suddenly excited, and make repeated darts at each other, their fins are raised, and, as well as the whole body, shine with metallic colours of dazzling beauty, while the projected gill membrane, waving like a black frill round the throat, adds something like grotesqueness to the general appearance. The Siamese, it is said, are as infatuated with the combats of these fishes, as the Malays with their cock-fights, and stake on the issue considerable sums, and sometimes even their own persons and families.

Labyrinthodon (λαβυρινθος, a labyrinth ὀδους, a tooth).—A genus of gigantic fossil *Batrachia*, allied to the salamanders. The structure of the teeth in the animals of this genus is extremely complicated, and gives rise to the name assigned to them. Footprints have been found in the new red sandstone, in different parts of England, which are referable to animals of the same genus. These have been described at different times under the names *Chirotherium*, *Mastodonsaurus*, *Salamandroides*, and *Phytosaurus* but the species described under these names are all distinctly referred by Professor Owen to the genus *Labyrinthodon*.

Lacertinidæ. *The Lizard family.*—A family

of reptiles belonging to the order *Saura*, and characterized by having a round and very elongated body, the tail especially long, being sometimes four times the length of the trunk; four strong feet, with four or five toes, of unequal length, and all armed with hooked claws; a quadrangular, flattened, pyramidal head, covered with horny symmetrical plates; eyes furnished with a membranous expansion resembling a third eyelid, and protected by a bony plate; a widely extended mouth, and a long, flat, exsertile, forked tongue. They are chiefly inhabitants of the Old World, and a few are found in Australia. This family corresponds with the Linnæan genus *Lacerta*, and contains many species which are now arranged in a considerable number of subgenera. They are extremely nimble in their movements, darting with great rapidity from one spot to another, and being enabled by their long hooked claws to cling to and creep along rocks and walls with great facility. They are gentle and timid in their habits, and live in holes which they either dig in the sand or find ready made. They are not social animals, a single pair only inhabiting each burrow or hole. They do not appear able to withstand great heat or great cold, as when exposed to either in an excessive degree, they become torpid. Lizards feed upon insects, worms, and small mollusca, &c. They are long-lived, and the females lay about seven or nine eggs, which they leave to be hatched by the warmth of the atmosphere. A few species, however, are viviparous. One of this kind, *Zootica vivipara*, the scaly lizard, is a native of England, and the female is said to hatch its young within its own body, if it be kept in a dry place, but to deposit eggs if in a moist one. It is about six inches long. Perhaps the most common species, however, is the green lizard, *Lacerta viridis*, an elegant animal, from ten to fifteen inches in length, and exhibiting a rich and varied mixture of green interspersed with spots, and marks of yellow, brown, &c. It is found in all the warmer parts of Europe, in Asia Minor, and as far north as the Channel Islands. The green lizard is a very active animal, feeding upon insects, and pursuing them with great celerity. These animals have the faculty of forming a new tail when it has been broken off, but this freshly acquired appendage has only a central cartilage in place of the bones, and is often covered with scales different from those of the old one. Upwards of fifty species have been described.

Lachesis.—A genus of serpents. See CROTALIDÆ.

Lactuca (*lac*, milk). *The Lettuce.*—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Cichoraceæ*, and deriving its generic name from the quantity of milky juice with which the plants abound. About sixty species are known, some of them of considerable importance to man, as supplying him with a wholesome article of food and a valuable medicine. The garden lettuce, *L. sativa* of Linnæus, is the species best known, and no fewer than 150 varieties have been produced by cultivation. Modern botanists have divided the Linnæan species, however, into four, *L. sativa*, *laciniata*, *crispa*, and *capitata*, all of which furnish the pot-herbs so well known for their delicate freshness and juicy flavour. Allowed to grow wild the lettuce has a disagreeable taste, and becomes hard and tough; but when scientifically cultivated, it affords the best and most abundant of our salads. The cultivation and sale of these plants give employment to a great many people, and the milky juice is in sufficient quantity to make the collecting of it an object of some importance. When allowed to dry, this juice concretes into a brownish matter of a bitter taste and strong odour, and is known under the name of *Lactucarium*. This substance has been employed by physicians as a substitute for opium, as it can be used when the constipating effects of the former render its exhibition inadmissible. The wild lettuce, *L. virosa*, is a common plant in many parts of Europe, and occurs in Great Britain, growing on dry banks and road sides. Lactucarium is obtained from the milky juice of this species also, and it is said to be of a superior quality to that got from the garden lettuce.

Ladanum.—A gum resin obtained from several species of *Cistus*, at one time in high repute and employed as a stimulant and expectorant. Herodotus mentions it as used by the Arabs for fumigation, and it is at the present day esteemed by the Turks for the same purpose and as a perfume. See CISTUS.

Læmodipoda.—An order of *Crustacea* belonging to the section *Edriopthalmi*, or sessile-eyed crustaceans. This order contains but few species, none of them large. The branchiæ or gills are vesicular, as in the amphipoda, but are only attached to the second and third, more rarely the first thoracic rings. The segments of the thorax are six in number, and the feet vary from five to seven pairs. The first is attached to the head, and, as well as the second pair, are terminated by prehensile claws, while the others are provided with a hook, flexible, and more or less prehensile also. The abdomen is reduced to such a rudimentary state that it is scarcely visible, being little else than a tubercle. The females carry their ova as the amphipoda do. Some of the species have the body cylindrical in shape, the legs long and very slender, and they live free and unattached, as the skeleton shrimps, *Caprella*, which are found amongst marine plants, creeping along in the same way as the "looping" caterpillars, often bending themselves back with great rapidity, and applying their antennæ to various parts of their body, while in swimming they bend the two ends of the body downwards. Others have the body much depressed, flat and broad, the feet thick and hooked at their extremity, and they live parasitical upon other

animals, as the whale lice, *Cyamus*, which are generally found attached to the bodies of whales, and are occasionally seen in such numbers upon them, that the individuals so infested are recognized at a considerable distance by the white colour thus imparted to them by the parasites.

Lagena (*lagena*, a bottle). — A genus of microscopic animals belonging to the class *Foraminifera*. The animals of this genus are contained within a calcareous shell of a very curious and beautiful flask-like form—hence the name. They are marine, the recent species being found attached to fuci, stones, &c., and several fossil ones occurring in sea sand and mud. In some the shell is globular, ovate, or cylindrical, and with a long produced external neck projecting from the upper extremity—these species belong to *Lagena* proper. Other species have the shell globose or ovate, sometimes compressed, with a tube arising from the orifice and projecting downwards into the cavity of the shell—these species belong to the sub-genus *Entoselinia*.

Lagenaria.—A genus of plants to which the common bottle gourd, *Cucurbita lagenaria*, now belongs. See CUCURBITA.

Lagenorhynchus (*lagena*, bottle; ῥυγχος, beak). *The Bottle-Nose Whale.*—A genus of cetaceans belonging to the family *Delphinidæ*, distinguished by the nose of the skull being depressed and expanded. Eight species have been described, two are natives of the north seas, and have been captured on the shores of Great Britain.

Lagerstræmia.—A genus of dicotyledonous plants belonging to the nat. ord. *Lythraceæ*, and forming the type of the sub-order *Lagerstræmieæ*. The species of which the genus consists are trees or shrubs, and are natives of India, China, and Japan. They are handsome plants, with tetragonal branches, opposite very entire leaves, and coloured or white flowers. *L. Reginæ* is conspicuous when in bloom from its large rose coloured flowers, the petals of which stand out on rather long claws. The bark and leaves are accounted purgative and hydragogue, and the seeds narcotic.

Lagetta. *The Lace Bark Tree.*—A genus of plants. See DAPHNEÆ.

Lagidium.—A genus of rodent animals. See CHINCHILLIDÆ.

Lagomys (λαγως, a hare; μυς, a rat).—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Leporidæ*. The animals belonging to this genus are distinguished by having small ears, no tail, and their upper incisive teeth so strongly furrowed as to make them appear double. The species are natives of Siberia and upper India. The sadajac or pika, *L. alpinus*, lives in the mountainous regions of Siberia, frequenting the most inaccessible rocks in woody spots. It is about nine inches in length, scarce exceeding a guinea pig in size, and is of a yellowish-red colour, with long white hairs intermixed with its fur. They burrow beneath the rocks or lodge in the fissures, remaining there during the day when the weather is fine, but sallying forth when the sky is dull and cloudy, and running about among the rocks, frequently uttering a sort of whistle or chirping bird-like sound. In summer and autumn they collect in troops, and prepare for their winter support, by collecting a plentiful assortment of the finest herbs and grasses, which they arrange in heaps like little hay ricks. These often form a timely succour to the sable hunters in winter, whose horses would otherwise be apt to perish for hunger did they not fall in with these serviceable supplies. They are said to live, in great part in summer, upon some species of veronica. Another species, a native of the south-eastern parts of Russia, *L. pusillus*, is known by the name of the calling hare. It is of small size, scarce six inches in length, is of a gentle disposition, and of solitary habits. It lives in burrows so artfully made, that it would be difficult to discover the creature were it not for the peculiar cry it makes, resembling the piping of a quail, but so loud that it may be heard at a surprising distance.

Lagopus (λαγως, a hare; πους, a foot). *The Grouse.* — A genus of birds belonging to the order *Gallinæ*, and family *Tetraonidæ*, and remarkable for having the tarsi and toes entirely covered with feathers, giving them somewhat the appearance of a hare's foot—hence the generic name. The species inhabit the mountainous regions of the north of Europe, Asia, and America, especially such as are covered with snow. In this they seem to take as much delight as web-footed birds do in water. They live in families, and continue in society from the month of September to April or May. At that time they pair, each pair living single, the female making her nest in the ground beneath a rock or under a tree. The male is very attentive during the time of incubation. He has a loud hoarse cry, while the female cackles like the domestic hen. These birds fly heavy but run swiftly, and feed upon berries, the buds of trees and plants, lichens, and even insects. Their flesh is good, and accordingly they afford great and exciting sport to those who follow the chase. In some of the species the plumage becomes quite white in winter. This is especially the case with the ptarmigan or white grouse, *L. mutus*, whose summer plumage is of a pale brown or ash colour mottled with small dusky spots and bars, but which is pure white in winter, except in the male who has a black line between the bill and the eye. This bird is about fifteen inches long, and is fond of lofty situations and northern climates. It is found in most of the northern parts of Europe, even as far as Greenland, and is at times not uncommon on the summits of some of the highest hills in the Highlands of Scotland. The red grouse or moorcock, *L. Scoticus*, does not change the colour of its plumage in winter. This bird is about the size of the ptarmigan, and appears to be peculiar to Great Britain, and is especially abundant in the hilly

districts of Scotland. They are handsome birds, and very much esteemed as game.

Lagorchestes.—The kangaroo hare. See MACROPIDÆ.

Lagostomus.—A genus of rodent animals. See CHINCHILLIDÆ.

Lagothrix (*λαγως*, a hare; *θριξ*, hair).—A genus of quadrumanous animals belonging to the family *Cebidæ*, containing a few species of American monkeys, with limbs not very highly developed, the fore ones provided with thumbs, and a long and prehensile tail, the under surface of which at the tip is naked. Their facial angle is about 50°, and their fur is soft to the touch and almost woolly. They live in the forests in large troops and are of a gentle disposition. The caparro, *L. Humboldtii*, is about two feet two inches in length, not including the tail, which is longer than the body. It is found at the mouth of the Oronoco, and on the banks of the Rio Guaviare.

Lagotis.—A genus of rodent animals. See CHINCHILLIDÆ.

Lama. *The Llama.*—A genus of animals belonging to the class *Mammalia*, order *Ungulata*, family *Bovidæ*, and tribe *Camelina*. They are the camels of the New World, being confined to South America. Their teeth are much the same as in the camels; their back, however, is not humped; their tail is short and hairy; their toes are slender and their soles narrow, separate in front. In a wild state the llamas keep together in herds, sometimes of one or two hundred. They appear to keep a careful look out, and when disturbed gallop off with great rapidity. There are two distinct species found wild in South America, inhabiting the Peruvian Alps, the Pampas, and mountains of Chili, and extending to the Straits of Magalhaens. The vicugna, *L. vicugna*, is chiefly a native of the most elevated table land and mountains of Bolivia and Chili. It is purely a wild species, and has hitherto resisted all the efforts of the aborigines to render it prolific in domesticity. They have the habit of jumping and kicking with their hind legs. The guanaco, *L. guanacus*, is the characteristic quadruped of the plains of Patagonia, and is very common over the whole of the temperate parts of the continent, as far south as the islands near Cape Horn. They live in herds and are generally wild and extremely wary, but are notwithstanding easily domesticated. In many of their habits they are like a flock of sheep, are not difficult to be caught, and, when wild, appear to have no idea of defence. In addition to these two wild species, two others are found domesticated; and most travellers who have lived for any time where these animals abound, maintain they are distinct from the wild ones. The llama or yamma, *L. glama*, has long and slender legs, and is of a whitish colour; while the alpaca, *L. pacos*, has short legs, and is generally of a blackish hue. These animals, when South America was first discovered by the Spaniards, were the only beasts of burden the natives possessed, and were in many other respects of the greatest importance to them. They transported their baggage and merchandise from one part of the country to another; they furnished a wool of which the natives of Peru and Chili manufactured their clothes, and their flesh supplied them with food. In those parts of South America, however, these animals are fast disappearing. The more useful and profitable European sheep have supplied their place for wool and food, and the common ass and mule are everywhere taking their place as beasts of burden. The llamas have been also described under the name of *Auchenia*, and some fossil remains of an animal nearly allied to the genus have been found in South America, and have received the name of *Macrauchenia*. This animal must have equalled in stature the rhinoceros or hippopotamus.

Lamellicornes (*lamina*, a small plate; *cornu*, a horn).—A tribe or section of pentamerous *Coleoptera*, containing numerous species of beetles, characterized by their antennæ, which are inserted in a small hollow in front of the eyes, being short and usually composed of nine or ten joints, the last of which are large and flat and open like a fan. This tribe of insects comprises the most bulky and gigantic of the beetle tribes, and the majority, especially the larger species, are inhabitants of tropical climates. According to the latest arrangement, the genera included under the *Lamellicornes* amount to about 400, and the species to nearly 4,000. It contains two numerous families, the LUCANIDÆ and SCARABÆIDÆ, to which we refer for further particulars.

Lamia.—A genus of beetles. See CERAMBYCIDÆ.

Lamiaceæ.—A synonym of LABIATÆ.

Laminaria.—A genus of *Algæ*. See THALLOGENÆ.

Lamium. *The Dead Nettle.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing several species indigenous to Europe and Asia. About six species are found growing in Great Britain, generally in waste places. The leaves of *L. album*, the common white dead nettle, have been used in infusion as a pectoral medicine, and as well as those of *L. purpureum*, the red dead nettle, are eaten in Sweden boiled as pot-herbs.

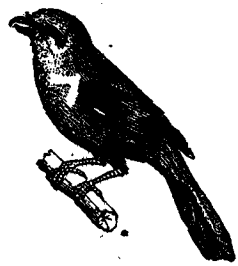
Lampris (*λαμπρος*, brilliant).—A genus of acanthopterygious fishes belonging to the family *Zeidæ*, and nearly related to *Zeus* or the John Dory. One of the species is called the opah or king fish, *L. guttatus*, and is a very brilliantly coloured fish. Its back is of a rich green, reflecting both purple and gold in different lights, and passing into yellowish-green below. Numerous spots, some milk-white and others of a silver lustre, are scattered over the body. The opercula are brilliant, the iris of a scarlet colour, and the fins of a bright vermilion hue. This rare and beautiful fish has been taken on the British coasts.

Lampyridæ. — A family of pentamerous *Coleoptera* known by the name of glow-worms, and of which the genus *Lampyris* is the type. The males of these insects are winged, but the females are apterous or wingless. About fifteen or sixteen species are known, found in Europe, Asia, Africa, and America. The best known species is the common glow-worm, *L. noctiluca*, a native of England. It is the female insect, which has no wings, that gives out the light for which they are famed. They are more abundant than the male, which generally keeps concealed during the day in trunks of trees. The light proceeds from the under part of the abdomen, near the tip, and the animal has it apparently completely under its will. The larvæ of these insects it is now found live upon snails. The species of this family, however, are for the greatest part exotic, and few exceed an inch in length. Between 200 and 300 have been described.

Lampyris. *The Glow-Worm.*—A genus of beetles. See LAMPYRIDÆ.

Lanarkite.—The sulphato-carbonate of lead, found at the Lead Hills in Lanarkshire, Scotland. It occurs in long slender crystals, and its specific gravity is 6·8 to 7.

Laniidæ. *The Shrikes* and *Butcher Birds.*—A family of birds belonging to the dentirostral tribe of the order *Passeres*, and corresponding to the Linnæan genus *Lanius*. The species are numerous, and are found both in the Old and New World. They have strong compressed bills with a deep notch at the tip of the upper mandible, and are of carnivorous habits. Some of the species are amongst the largest, and are certainly the most rapacious birds of the tribe to which they belong. In their general habits indeed they resemble the falcons, for they sit motionless upon their perch, watching for their prey, and then suddenly dart upon it. In some of the species the bills are short, with the tooth of the upper mandible very prominent. Such are the butcher birds, *Laniinæ*, natives of most parts of the world, and generally found in small flocks, pursuing grasshoppers, insects, young frogs, and small birds. Others have the bill lengthened, emarginated, and hooked. Such are the bush shrikes, *Thamnophilinæ*, which are inhabitants of Australia, Africa, and South America. Of the former of these sub-families the genus *Lanius* is the type, and though several species are well known, the most common, and the one whose habits have been most observed, is the sentinel butcher bird, *Lanius excubitor*. It is only an occasional visitant of this country, but is common in France, and is also found in Spain, Portugal, and Italy. This bird is about the size of a thrush, and is of an ash colour on the upper parts of its body, whitish beneath, and black on the wings and tail. It feeds upon mice, shrews, small birds, frogs, lizards, and large insects, and derives its name of *Butcher bird* from the habit it has of suspending its prey, after it has killed it, impaled upon thorns, hanging it up as a butcher does his meat. It is said to destroy young pheasants when in the breeding coops, drawing them through the bars. All small birds have an antipathy to the butcher bird, betray anger, and utter the moan of danger when it approaches their nests. They will mob, attack, and drive it away, as they do the owl, as if fully aware of its plundering propensities. It is said that this bird uses artifice to attract other birds within its reach, perching upon some tree or post and uttering loud cries as if of some bird in danger, and when allured by the plaintive notes they come within its reach, it pounces upon them in a moment. During the pairing season the butcher bird has a very pleasing note, expanding its throat at the time like the green frog. Both parents show great attachment to their young, and they exhibit great courage in defending themselves and their nests from more powerful enemies. The American butcher bird, *Lanius septentrionalis*, shows a degree of courage and intrepidity beyond all birds of his size, and is remarkable for his affection for his young. In their defence he will attack the largest hawk or eagle with a resolution truly astonishing; so that all of them respect him, and on every occasion decline the contest. The bush shrikes, *Thamnophilinæ*, live among thick trees, bushes, and underwood, where they are perpetually prowling about after insects and young or sickly birds, and are great destroyers of eggs. They do not seize their prey with their claws, nor do they dart at it on the wing, but capture it with their bill, which is long, abruptly hooked at the end, and armed with a strong tooth.



Lanius excubitor—The Sentinel Butcher Bird.

Lansium.—A genus of dicotyledonous plants belonging to the nat. ord. *Meliaceæ*, and containing as species several moderate sized trees, natives of the Malayan Archipelago, which bear the fruits known by the names langsat or lanseh and the ayer-ayer, both so much esteemed by the Malays and European residents. The juicy envelope of the seeds is the part eaten, and the taste is cooling and pleasant, though the skin contains a colouring juice, extremely bitter and apt to taint the fruit if not opened with care.

Lantana.—A genus of dicotyledonous plants belonging to the nat. ord. *Verbenaceæ*, and containing several species natives of tropical America, mostly shrubs, armed with prickles, and having violet, orange, yellow, or white flowers, which are arranged in axillary clusters and accompanied with bracteæ, the outer of which form a sort of involucre round each head. The leaves and flowers of some possess an agreeable aromatic odour, and are used in Brazil, under the name of *Camara*, for making medicated baths for diseases of the skin. The leaves of some species are also used as a substitute for tea.

Lanthanite.—A metal allied to yttrium, and found coating *Cerite* at Bastnäs in Sweden. It is of a grayish colour and a dull or pearly lustre. It is a carbonate of cerium.

Lapis Lazuli, Lazulite, or Hauyne.—A mineral substance of an azure-blue colour, found in crystals, in grains, or in veins in Vesuvian lavas, in basalt, and in granitic rocks. When it occurs of a fine blue colour and free from white spots, it is highly esteemed by lapidaries, and used for ornamenting tops of snuff-boxes and other articles. Formerly, however, its chief use was to furnish painters with the beautiful blue colour so much prized for its permanence, called *Ultramarine*. This colour has lately been in such demand for calico printing that it is now prepared artificially, and can be made so cheap as to supersede the original material. The use of ultramarine was introduced about the end of the fifteenth century.

Lapsana.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and containing five or six species, all herbaceous and all natives of Europe. The most common species is *L. communis*, or nipple wort, growing in uncultivated places in England and many other parts in Europe, and deriving its English name from its being considered a specific in cases of inflamed and chapped nipples. In France it is called "herbe aux mamelles."

Lardizabala.—A genus of dicotyledonous plants belonging to the nat. ord. *Menispermaceæ*, and named after the Spanish naturalist *Lardizala*. The genus contains three or four species of twining shrubs growing in South America, one of which, *L. biternata*, affords a fruit which has a pulp of a sweet and grateful flavour, and is sold in the markets of Chili and Peru, under the names of *Aguil-boguil* and *Coguilvochi*.

Laridæ. *The Gull family.*—A family of birds belonging to the order *Anseres* or web-footed birds, having very long wings, a compressed bill and the hind toe free and sometimes very short and rudimentary. The genera are numerous, and the species of which they are composed are arranged in three different sub-families, *Larinæ* or gulls, *Rhyncopsinæ* or skimmers, and *Sterninæ* or terns. The sub-family *Larinæ* contains the true gulls, and corresponds with the Linnæan genus *Larus*. Their bill is of moderate length, compressed laterally, and hooked at the tip. Their wings are very long and pointed, and their plumage is thick and close. Gulls are found in all parts of the world, inhabiting rugged cliffs and rocky islets in the sea. They especially abound in northern climates, and our arctic navigators find them in the high latitudes in immense abundance. They are very voracious, and feed upon all kinds of animal matter whether fresh or putrid. In the northern regions they feed upon dead whales and other larger marine animals, which they find floating in the sea or among the broken ice, and in temperate and cultivated countries they often seek the interior and prey upon worms, slugs, and larvæ of insects. They are thus often of use to man. Their flesh is very indifferent eating, but nevertheless many of them are brought to market in Catholic countries during Lent. The genus *Larus* is the type of this sub-family, and contains several species. *L. glaucus*, the glaucous gull, is one of the largest, attaining a considerable size, and is a native of the most northern regions as well as the coasts of Great Britain. *L. marinus*, the black-backed gull, is nearly as large, measuring from twenty-six to twenty-nine inches in length, and five feet nine inches in extent of wing. It is common in the northern parts of Great Britain, as the Hebrides, Shetland Isles, &c. *L. argentatus*, the herring gull, is smaller than the preceding, is common on the coasts of Great Britain, and is also found on the shores of the Mediterranean and Atlantic Oceans. It obtains its name from pursuing and preying upon the shoals of herrings, and is said to be remarkably vigilant and to be a constant attendant upon the fishermen's nets. *L. eburneus*, the ivory gull, obtains its name from the pure whiteness of its plumage, and is a native of the arctic regions, especially in the neighbourhood of Baffin's Bay. It is occasionally met with on our coasts, but is very rare compared with *L. canus*, the common gull. This species is abundant on the shores of Great Britain, and during winter frequents all parts of the coast where high bold shores present it with a favourable situation. At the approach of storms the gulls may be met with leaving the sea shores and extending over all the interior of the country. The genus *Stercorarius* contains one or two curious species. *S. parasiticus*, the arctic gull, is common in the northern parts of Europe, Asia, and America, and is by no means uncommon in the northern parts of Great Britain. They are about twenty-one inches in length, and are very fierce and ravenous. The peculiarity of their habits consists in the manner in which they generally obtain their food. As soon as they see some other gull, of a less powerful and determined nature, secure a prize worth contending for, as a herring for instance, they give chase immediately, and buffet and harass the unfortunate object of their attack till he is compelled to disgorge, or drop the coveted morsel. This the

pirate seldom fails to catch before it falls. In Scotland this bird is commonly known by the name of "dirten allen," and by the Danes it is called "stroudt-jager" or "dung bird." The skua gull, *S. cataractes*, is a more formidable species still, is two feet in length and between four and five in extent of wing, and preys upon fishes, smaller species of water fowl, and, it is said, will even attack young lambs. It is a native of the high latitudes in both hemispheres, but is occasionally met with on our own shores. It is courageous in defence of its young, and will attack with eagle-like courage and ferocity, any animal that dares to disturb them. The feathers of the skua gull are preferred by many people to those of the goose, and in some parts great numbers are killed for the sake of them. The genus *Xema* contains a good many species, the most common perhaps of which is the black-headed gull or pewit, *X. ridibunda*, which builds its nests in low situations, such as moist meadows, unlike the other gulls which fix upon elevated rocks and cliffs where to breed. They frequent rivers, lakes, &c., some distance inland in summer, and the sea shore in winter. Their food consists of worms, insects, small fishes, &c. The eggs of this bird are well flavoured, and the young were in this country at one time in high repute at the tables of the wealthy. The sub-family *Rhyncopsinæ* contains the birds generally called the skimmers. The upper mandible is much shorter than the lower, and both are straight and truncated at the ends. Their wings are long and curved, and their habit is to skim along the surface of the sea and dip the lower mandible in the water, the upper being elevated out of the water until the prey is felt by the lower. The typical species is the black skimmer or sheerwater, *Rhyncops nigra*, a native of America. It is a bird of passage in the United States, residing along the whole Atlantic coast in summer and breeding there, but disappearing in autumn and retreating to near the tropics. Its favourite haunts are low sand bars, raised above the reach of the summer tides; and also dry flat sands on the beach in front of the ocean. It is rarely seen far out at sea, and still more rarely swimming, but it flies with a slowly flapping flight, dipping occasionally, with steady expanded wings, its lower mandible into the sea, and with open mouth receiving its food as it ploughs along the surface. The sub-family *Sterninæ* contains the terns. These birds have the bill lengthened, straight, slender, and rather curved at the tip; their wings long and pointed, and their legs rather short, with their hind toe, if apparent, always elevated. They are very generally diffused, being met with on almost every coast in the world, and occasionally proceed inland to rivers and lakes. They are almost always on the wing, and feed nearly exclusively upon small fishes, which they seize while flying, descending like a shot to the water and capturing their prey. Occasionally they attack the eggs and young of water birds, and a few feed upon insects, like the swallows. The common or great tern, *S. hirundo*, is about fourteen inches in length, is found in various parts of Europe and Asia, and is very common in Great Britain. The upper part of its body and wings are of a bluish-ash colour, the under parts are pure white, the forehead, top of the head, and long occipital feathers are deep black, and its long bill, legs, and feet are red. Their long pointed wings and small but muscular bodies admirably adapt them for lengthened and sustained flight, and afford the means by which they are enabled to traverse the surface of the deep with never tiring wings. Their form, with their long forked tail, and their habits of rapidly precipitating themselves upon their prey, have obtained for them the name of the sea swallows. They do not confine themselves to the sea coast, but frequently resort to inland streams and lakes, and the female makes her nest in the moss or high coarse grass, near the lake. During incubation she becomes very bold, and will attack any person approaching too near her nest. The little or lesser tern, *S. minuta*, is a sort of miniature of the preceding; in its plumage, habits, and manners being very similar, but being much smaller. The upper part of the body is of a plain lead coloured gray, while the upper parts exhibit close-set feathers of a clear and glossy whiteness. It frequently visits the interior of the country, and feeds upon insects, &c., as well as small fishes, which it captures in the same manner as the preceding species does. The bird commonly known, especially to sailors, by the familiar name of noddy, *Anous stolidus*, belongs also to this sub-family. It is also called the noddy tern and black noddy. The tail is not forked, and the plumage has a general resemblance to that of the petrels. It is of a brown-black colour, and is well known to sailors from the apparent stupidity with which it alights on board ships at sea, and allows itself to be taken without attempting to fly away. It is one of the most widely distributed of birds, and breeds on uninhabited islands.

Larva.—The first state of an insect's life after its exclusion from the egg, and previous to its assuming the chrysalis or pupa form. Larvæ are commonly known by the names of grubs, maggots, and caterpillars.

Laserpitium.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and containing a number of species of herbaceous plants, many of which abound in a resinous juice which has a bitter, acrid, and even somewhat caustic taste, and acts as a violent purgative. The aromatic gum resin, the produce of the root of *L. siler*, is considered by most botanists to be the same as the *Laser* of the ancients, a gum resin in great repute amongst them. It is said to have had such a high reputation, at an early period, as to have sold for its weight in gold.

Lastrea.—A genus of ferns containing several species separated from the genus *Aspidium*, such as *L. filix-mas*, or the male fern. See ACROGENÆ.

Lathræa. *Tooth-Wort.*—A genus of dicotyledonous plants belonging to the nat. ord. *Orobanchaceæ*. The species are perennial, succulent, pallid herbs, partly subterraneous, and generally considered to be parasitical upon the roots of trees. *L. squamaria*, the greater tooth-wort, is a native of Britain, and is found at the roots of hazels or elms.

Lathyrus.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and containing a good many species, all of which are herbaceous, and usually climbing. Several are natives of Britain, and are ornamental plants when seen climbing over hedges and on wooded banks.

Lauraceæ. *The Laurel family.*—A nat. ord. of dicotyledonous plants, corresponding with the Linnæan genus *Laurus*. A number of species belong to this family, and lately several genera have been made. They are all trees or shrubs, inhabit the warmer parts of the globe, and most of them are more or less aromatic. The genus *Laurus* is the type of the family, though almost all the species which formerly belonged to it are now removed to other genera. The common, or sweetbay laurel, *Laurus nobilis*, is a tree which has been known from time immemorial. The leaves are evergreen, and were used by the ancients to form crowns or rewards for the victors in the Pythian games in honour of Apollo. In the middle ages the successful candidates for academic honours received a crown of laurel leaves mixed with berries, hence the name of *Bacca-laureate*. The laurel is a native of the north of Africa, south of Europe, and Asia. In its native countries it reaches the height of thirty feet, but in our colder climate, where it is extensively cultivated, it seldom reaches half that height. The whole plant, but especially the leaves, abounds in an essential oil of an aromatic nature, and of tonic and stimulant qualities. The species which produces the camphor of commerce was formerly included in the genus *Laurus*, but is now referred to the genus CAMPHORA, which see. Cinnamon, one of the most extensively used of all the aromatic substances, is the produce of another species, now placed in the genus CINNAMOMUM, which see. The pear-shaped succulent fruit called avocado, alligator pear, or subaltern's-butter, is the produce of a species of this family, a native of South America. This plant, *Persea gratissima*, is a fine tree, growing to the height of forty feet, and is extensively cultivated for its fruit, which is of a considerable size. Under a thin but resisting skin of a greenish or violet colour, it contains an abundant pulp of a peculiar flavour, and which melts in the mouth almost like butter. The substance known and used in medicine as sassafras, is the root of *Sassafras officinale*, a tree which is found growing throughout all North America, from Canada to Florida. In the Southern States it grows to a height of near thirty feet, but in the colder parts it seldom exceeds ten. At one time sassafras was much used in medicine, and recommended as a warm aromatic stimulant and diaphoretic in rheumatic affections, and in syphilitic cases. The spice wood, or fever bush of North America, *Benzoin odoriferum*, was at one time supposed to yield the aromatic substance known as gum benzoin. It is a tree about ten feet high, and is found growing, like the preceding, from Canada to Florida, in low situations beside streams. The leaves and wood possess a decided balsamic odour. The bebeeru bark, which has lately been found to contain an alkaloid called *Bebeerina*, used in medicine as an antiperiodic, is the product of *Nectandra Rodiœi*, a large tree belonging to this family, and growing in British Guiana. The wood of the tree is imported for ship-building under the name of green heart.

Laurus. *The Laurel.*—See LAURACEÆ.

Lava.—The mineral substances, products of active volcanoes, are called by the general name of *lava*. When erupted, it is generally a semi-fluid mass, about the consistence of butter, but it soon cools externally, the internal mass, however, remaining liquid for a length of time. It consists of various minerals, but the chief is pyroxene.

Lavandula (*lavare*, to wash). *The Lavender.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing a number of species which are herbaceous, or slightly shrubby, and grow, for the greater part, in the countries bordering the Mediterranean, from Greece on one side to Egypt on the other. Some are found also in Madeira, and the Canaries, Spain, India, and Persia. Several of the species possess considerable interest. *L. stœchas*, a small shrubby species, growing in the dry warm parts of the shores of the Mediterranean, has a strong odour of camphor, and has been used in medicine in asthmas and pulmonary affections. *L. spica*, commonly known as the spike lavender, is a shrubby species, a native of Southern Europe. Its odour is stronger than the last, and it possesses similar virtues, only in a higher degree. An essential oil is procured from it, which is an object of some commercial importance in France. From the department of Vaucluse, from 6,000 to 8,000 lbs. weight are annually exported. It is used in veterinary medicine, and in the preparation of certain varnishes. *L. vera*, the true or common lavender, is an abundant species in the south of France, and much cultivated in all parts of Europe. It is from this species, and two others, *L. angustifolia* and *L. latifolia*, that the various preparations are obtained, such as the oil of lavender, essence of lavender, lavender water, &c. A vinegar is also made by distilling fresh flowers in good purified vinegar. Some of these preparations are used in medicine, and have a good effect in relieving spasms of the stomach, &c. As the stalks and flowers retain their odour long

after being dried, they are much used for putting in drawers amongst clothes, or in places where a disagreeable smell is evolved. At one time lavender was much employed for infusing in warm baths, with the intention of rendering these more energetic, and for making fomentations, hence the name for the genus.

Lavatera. *The Tree Mallow.*—A genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*, and named after the celebrated Lavater. The species are mostly shrubs, or small trees, and are found growing in almost all parts of Europe, especially the western parts. Upwards of twenty-six species have been described, and many of these are handsome ornamental plants, well adapted for shrubberies. The typical species and the one best known is *L. arborea*, the common tree mallow, a plant resembling a small tree with showy flowers, and which is a native of Britain, various other parts of Europe, North Africa, and the Canaries.

Lawsonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Lythraceæ*, and consisting of only one species, which is a native of the East. This plant, *L. alba*, is unarmed when young, but becomes spinous as it grows older. It contains a large quantity of colouring matter which dyes orange, and is well known as the al-henna, henna, or hinna, so much used by the women of the East to dye their nails, tips of their fingers, and soles of their feet. It is the kupros or cyprus of the ancients, and is believed to be the copher or "cluster of camphire," of the Song of Solomon. It is extensively cultivated in India, and the flowers are very fragrant.

Lazulite.—See LAPIS LAZULI.

Lead. *Plumbum.*—One of the softest, but one of the most useful of all metals. It is very durable and malleable, and may be reduced by hammering into very thin plates, but its ductility is not great, and its tenacity is so small, that a wire one-tenth of an inch in diameter, can only support a weight of 30 lbs. without breaking. Lead is of a bluish-white colour, leaves a mark upon paper, has no taste, but acquires a peculiar smell by friction. Its specific gravity is 11·407, and it melts at a temperature of 606°. The principal supply of lead is obtained from the ore called galena, or sulphide of lead, and extensive mines of this valuable ore are found in various parts of the world. The mines of Great Britain have been wrought from a very remote era. Those in Derbyshire are said to produce 5,000 or 6,000 tons annually. The mines on the borders of Cumberland and Northumberland yield from 11,000 to 12,000 tons, whilst those of Scotland are believed to produce upwards of 4,000 tons. A considerable quantity is procured also from mines in North Wales. The exports from this country in the year 1832, from 1st January, 1832, to 1st January, 1833, amounted to 13,898 tons; and in 1855 the gross value of lead ore, the produce of the United Kingdom, was estimated at £1,500,000! The mines of Spain yield a very large amount, and now the Spaniards are enabled to undersell every other people, the richness of the ore, and the facility by which it is obtained, enabling them to do so with facility. A considerable quantity of silver is contained in the lead ore, and several processes are in use for extracting it. Lead is very much used, as in the construction of water pipes and cisterns, and for covering flat surfaces, the tops of buildings, &c. Some of the salts of lead are extremely poisonous, and some are used in medicine. The acetate of lead, or sugar of lead as it is commonly called, forms a valuable external application, and is often used as a sedative internally also. Oxide of lead enters into the composition of white glass, which it renders clearer and more fusible. It is also used for glazing common earthen vessels, and this is the reason why pickles kept in common red pans become so often poisonous. Lead mixed with tin and a small quantity of some of the other metals, forms pewter; mixed with antimony, it forms the alloy of which printing types are made.

Lecanium.—A synonym of the genus *Coccus*, and to which the *Kermes*, or *Coccus ilicis* belongs. See COCCIDÆ.

Lecanora.—A genus of acotyledonous plants. See THALLOGENÆ.

Lecythideæ, (ληκυθος, a jar).—A sub-order of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, containing a number of species, natives of South America, and distinguished by their very large fleshy flowers, and singular fruits. The species of the typical genus *Lecythis* are large trees, with hard woody urn-shaped fruits. *L. ollaria* inhabits the forests of Cumăna and Brazil. The fruit is about the size of a child's head, and contains numerous seeds which are eatable. The fruit is known by the name of "monkey pots," and is used by the natives for various purposes, as cups, &c., &c. *L. zapucajo*, a native of Guiana, is a large tree with a fruit four inches broad and six inches high, containing numerous seeds as large as almonds, and very pleasant to the taste. They are to be met with in our fruiterers' shops under the name of sapucaya nuts. The Brazil nuts are the produce of the genus BERTHOLLETIA. The cannon ball tree, *Couroupita Guianensis*, belongs to this sub-order. It obtains its English name from its peculiar large, heavy, woody fruit, which is about the size of a 36 lb. shot. It is a large tree with a stem two feet in diameter, and large handsome flowers of a deep rose colour, or white. The shells of the fruit are used as drinking vessels.

Lecythis.—See LECYTHIDEÆ.

Ledum.—A genus of dicotyledonous plants belonging to the nat. ord. *Ericaceæ*. Two or three species are known, all natives of North America, and north of Europe, and small shrubs. The leaves are astringent and aromatic, and possess narcotic qualities. *L. latifolium* grows abundantly in Labrador, and is often employed

in the shape of an infusion under the name of Labrador tea.

Leguminosæ. *Leguminous Plants*, or the *Pea* and *Bean family*.—An extensive and important nat. ord. of dicotyledonous plants, which are characterized by their having papilionaceous flowers, and leguminous fruits. The species are very various in appearance. Some are herbaceous, others shrubs, and others again large trees. Some have papilionaceous flowers with a drupe as the fruit, others have irregular flowers, and the fruit in form of a legume. The species are so numerous that they have been arranged in three sub-orders, *Papilionaceæ*, *Cæsalpineæ*, and *Mimoseæ*, all of great extent, and containing many plants which are extremely useful to man. This extensive order contains about 467 genera, and not fewer than 6,500 species. They are found in all parts of the world except, it is said, in the islands of Tristan d'Acunha and St. Helena. They diminish in numbers as they approach the pole, and are so numerous in the equatorial regions that it has been calculated one-tenth of the number of phanerogamous plants in the equinoctial zone are leguminous. The *Cæsalpineæ* are most abundant within the tropics; the *Mimoseæ* in South America, Africa, and Asia; and the *Papilionaceæ* in temperate climates. There exists a higher degree of irritability in the plants of this order than in any other. Witness for instance the *Mimosa sensitiva*, or sensitive plant, and *Desmodium gyrans*, &c. Amongst the trees of the order many are much sought after for cabinetmaking purposes, as the Brazilwood, *Cæsalpinia Brasiliensis*; the sappanwood, *C. sappan*; morawood, *Mora excelsa*; rosewood, *Trioptolomea*, &c., &c. Many of the herbaceous species afford nourishment to a great extent to cattle, such as the clovers, *Trifolium*; lucern, *Medicago sativa*; sanfoin, *Onobrychis*, &c. The seeds of many are of great importance to man, as the beans, *Faba*; the peas, *Pisum*, &c., &c. The tonka bean, *Dipterix odorata*, is highly aromatic, and the rhizome of *Arachis hypogœa*, or ground nut, is edible. The species of *Cassia* and *Tamarindicus* afford fruits which are purgative, while the catechu plant, *Acacia Catechu*, on the other hand furnishes a powerful astringent. Some of the species contain a quantity of saccharine matter, such as the roots of *Glycyrrhiza glabra*, the liquorice plant; others yield a kind of manna, as the alhagi, *A. Maurorum*. From some are obtained resins, as kino, the produce of one or two species of *Pterocarpus*; gum dragon, the produce of *Pterocarpus Draco*, &c.; from others we get the liquid resins, or balsams, such as the balsam of Peru, and the balsam of Tolu, which are the products of two species of *Myroxylon*, or *Myrospermum*, the balsam of copaiva, the secretion of several species of *Copaifera*, &c.; whilst from others still we obtain valuable gums, as gum arabic from the *Acacia*, gum tragacanth from several species of *Astragalus*, &c. Valuable dyes are also obtained from various plants of this family, as the logwood, *Hæmatoxylon Campeachianum*, the indigo, *Indigofera tinctorea*, &c.

Leipoa.—A genus of birds belonging to the order *Gallinæ*, and family *Megapodidæ*. The only species as yet known, *L. ocellata*, is a native of Western Australia, and is known to the colonists by the name of the "native pheasant." Its habits are like those of the common fowl, but like the rest of the family to which it belongs, it deposits its eggs in a mound of sand, about nine feet in diameter, and three feet high, and leaves them there to be hatched by the heat of the sun. The natives are very fond of the eggs, and rob the mounds two or three times in a season.

Lemna. *Duck Weed.*—A genus of monocotyledonous plants. See ARACEÆ.

Lemur.—See LEMURIDÆ.

Lemuridæ.—A family of animals belonging to the order *Primates*, and division *Quadrumana*. The animals belonging to this family are more quadruped-like in their form than the monkeys, and have their lower incisive teeth produced and slanting. The forefingers of the hinder extremities are armed with an elevated pointed claw; all the others have flat nails. They are generally covered with a soft woolly fur, and live for the most part on fruits and insects. The genus *Lemur* is the type of the family, and is characterized by having four incisive teeth in upper and six in lower jaw, two canines in each jaw, and five molars on each side in upper and four in lower jaw. The species are generally of a slight form, with an elongated conical head, a very thick fur, short ears, and a long, but not prehensile tail. The hind legs are long, and the thumbs well separated from the other fingers, and as they are opposed, the hinder hands are rendered tolerably perfect instruments of prehension. They live in troops on trees, are mild and inoffensive, and feed upon fruits and insects. Several species have been described, almost exclusively confined to the island of Madagascar. The ruffed lemur, *L. macaco*, is the best known species, and may be considered the type. It is a native of Madagascar, and is said to be very wild in its native haunts. Its fur is varied with large black and white spots. The ring-tailed lemur, *L. catta*, is rather smaller than the preceding, its fur is of an ash colour, and its tail barred with alternate black and white rings. It is of a gentle disposition, and in captivity shows a deal of curiosity in its disposition. It is very agile, and climbs with the greatest facility the most difficult places. The white fronted lemur, *L. albifrons*, is one of the most interesting of the species of this genus. Its fur is of a ruddy or bronze-gray above, and white beneath, and the male has the front white. It is an exceedingly nimble animal, and leaps a distance of many yards so lightly, that its footfall can scarcely be heard. In confinement it is very affectionate and playful. The genus *Loris* contains several

species, natives of India. Little is known of their habits in a state of nature, except that they eat fruit and insects, and are nocturnal animals. They have four incisive teeth in upper and six in lower jaw, a round head, large prominent eyes, slender limbs, and no tail. The slender loris, *L. gracilis*, is a native of Ceylon, is a small slender animal, and has a fine soft woolly fur of a somewhat reddish colour. It is very slow in its movements, is very timid, and lives on eggs, insects, and fruit. The slow-paced lemur, or tailless macauco, and one or two other closely allied species have been separated from the *Loris*, and form the genus *Nycticebus*, characterized by having six incisive teeth in upper and only two or four in lower jaw. These animals are remarkable for their round head and short muzzle, large round eyes approximating each other, and short and strong limbs. The body is thick and rather clumsy, and the tail is almost or entirely wanting. They are very slow in their movements, and when they walk on a flat surface have a very awkward appearance. They climb, however, with great facility, and can creep along places, most difficult of access, back downwards. They feed on insects, eggs, small birds, and fruit, and are completely nocturnal animals, sleeping during the day, and only making their appearance when night sets in. *Nyeticebus tardigradus*, the slow-

Nycticebus tardigradus.

paced lemur, has been well observed in confinement, but owing perhaps to its nocturnal habits, has been very little noticed in its native forests. It is clothed in a thick coat of close woolly hair, of a brownish colour, with a chestnut band along the back, and is a timid animal, but rather irascible when vexed. The genus *Indris*, or *Lichanotis*, contains three species which are peculiar to Madagascar, and are distinguished by their having a very short tail. They live in wooded places, feed upon insects and fruits, and only make their appearance at night. The short-tailed indri, *I. brevicaudatus*, is said to be trained by the natives of Madagascar to be useful in hunting. The genus *Galago* contains several species, all natives of Africa. They have very long tails and ears, large eyes, are very active, live upon trees, and feed on insects and fruits. They make a nest in the forks of branches, or in cavities of decayed trees, and in these they spend the day, coming forth only in the evening to seek their food. Of the habits of the species of tarsiers, *Tarsius*, and cheirogales, *Cheirogaleus*, little is known, except that they are nocturnal animals, and feed upon insects and fruit. The tarsiers are remarkable for the length of their tarsi, their long slender tail tufted at the extremity, and their large ears and eyes. They are natives of all the Moluccas and Indian islands.

Leo. *The Lion.*—A genus of feline mammalia. See FELINÆ.

Leontice.—A genus of dicotyledonous plants. See BERBERIDACEÆ.

Leontodon (λεων, a lion; ὀδους, a tooth).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and containing, amongst other species, the dandelion, *L. taraxicum*. This well known plant has been highly recommended of late years for its sedative, deobstruent, and diuretic properties. In chronic diseases of the liver, and in dropsy, arising from such causes, it is said to have succeeded in producing a cure, when all other medicines have failed. It contains a peculiar bitter principle, called *Taraxacine*.

Leopardus. *The Leopard.*—A genus of feline mammalia. See FELINÆ.

Leopoldinia.—A genus of palm trees. The piassaba palm, *L. piassaba*, is a fine tree, about from twenty to thirty feet high, the stem thick, and covered with innumerable fibres, the split marginal processes of the petioles. It is a native of Brazil and Venezuela, occurring in abundance on the banks of the tributaries of the Rio Negro. The leaves form an excellent thatch, and are universally used for that purpose by the natives of the parts where the trees grow. The fibrous or hairy covering of the stem is an extensive article of commerce, and seems to have been used from a very early period by the Brazilians to form cables for their canoes navigating the Amazon. It is well adapted for this purpose, as it is light (the cables made of it not sinking in water) and very durable. This fibrous substance is now imported in large quantities from Para to England, where it is generally used for making brooms for street sweeping and for houses.

Lepadidæ. *Pedunculated Cirripedes* or *Barnacle Shells.*—A family of *Crustacea*, belonging to the order *Cirripedia*. They are characterized by having a lengthened peduncle, which is coriaceous, hollow, flexible, and provided with muscles, by which they attach themselves to submarine bodies. The animal is included within a hard covering, called the *capitulum*, generally consisting of several shelly valves. The species are tolerably numerous, and are found extending over the whole world, the greater number, how-

ever, inhabiting the warmer, temperate, and tropical seas. Nearly half the number known are attached to floating objects or to animals which are able to change their position, while the other half are attached to fixed organic or inorganic bodies. A few of these have the power of excavating burrows in calcareous rocks, shells, and corals, such as the species of the genus *Lithotrya*. The name of barnacle shell was originally given to the genus *Lepas*, which may be known by the capitulum being compressed, and composed of five approximate valves. They derive this name from its being at one time believed that they gave origin to the barnacle goose! The peduncle in these is quite smooth, and in general very long, and they are attached by it to various floating bodies, ships' bottoms, &c. In others the peduncle is of moderate length, and covered with hard, shelly, scale-like appendages, while the capitulum is composed of numerous valves, in some instances amounting to as many as 100, as in the genus *Pollicipes*. These are generally attached to fixed substances, posts of wood, &c. The species of the genus *Alepas* have a very short peduncle, and the capitulum has no valves, or only horny ones, not containing any calcareous matter, and almost hidden in membrane. These are generally parasitic upon living bodies, such as medusæ, the skin of sharks, &c. Almost all the species of pedunculated cirripedes are true hermaphrodites, possessing both male and female organs. The late researches of Mr. Darwin, however, have made us acquainted with the extraordinary fact that in two genera, *Ibla* and *Scalpellum*, we meet with some species in which the males and females are distinct, the males being small, different in general appearance from the females, and living parasitic in their sac; whilst there are other species which are hermaphrodite, and in the sacs of which *males* are to be observed also! These are very small, possess neither mouth nor stomach, and are called by him *complemental males*.

Lepadogaster.—A genus of fishes. See CYCLOPTERIDÆ.

Lepas. *The Barnacle Shell.*—See LEPADIDÆ.

Lepidium.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and containing several species, of which the most remarkable is the garden cress, *L. sativum*. This well known plant is originally a native of Persia and the island of Cyprus. There are three varieties cultivated in our gardens—the broad leaved cress, the curled cress, and the plain leaved cress. It is the last that is used as a spring salad, and is remarkable for its warm and grateful relish. *L. latifolium*, a native of Great Britain and other parts of Europe, has a still warmer taste, and has been used instead of horse radish. Poor people are in the habit of eating it as a condiment to their food, and hence it has obtained the name of poor man's pepper.

Lepidodendron (λεπις, a scale; δενδρον, a tree).—A genus of extinct fossil plants, the exact position of which in the natural arrangement has given rise to a good deal of discussion. They appear, however, to occupy an intermediate place between coniferæ and lycopodiaceæ. Their leaves are arranged in somewhat the same manner as some of the coniferæ, and their scars are similar. Their branches bifurcate like the lycopodiaceæ, and the stems are found in some cases sixty or seventy feet long, with linear or lanceolate leaves, like those of some of the species of lycopodium

Lepidodendron elegans.

and eutassa. A fossil fruit, in form of a cone, is generally referred to a species of this genus. It is described under the name of *Lepidostrobus*.

Lepidoptera (λεπις, a scale; πτερον, a wing).—An order of insects, containing those which are generally known by the name of butterflies and moths. They are characterized by having four large extended membranous wings, covered above and below with numerous small imbricated scales, which to the naked eye resembles a quantity of powder scattered over them; a long proboscis or trunk, rolled up spirally; and two, generally long, antennæ of variable form. They undergo a perfect metamorphosis. The females are usually rather larger than the males, and their colours less brilliant. They are, generally speaking, very short lived in the *imago* state, the males dying soon after the act of generation is accomplished, and the females shortly after laying their eggs. They live upon the nectar of flowers, which they suck up by means of their proboscis, which is admirably adapted for penetrating to the depths of the narrowest blossoms. The females lay their eggs upon plants, the different species choosing the different plants which are calculated to afford the caterpillars their proper food. These eggs are glued to the surface; and as the fecundity of the female is very great, thousands of eggs are sometimes laid by one insect. When ready to be hatched, the young come forth under the appearance of a worm-like

animal, commonly known by the name of *larva*, or caterpillar. The body of this larva is long and cylindrical, and composed of thirteen segments. It possesses three pairs of simple articulated feet, which serve the purpose of walking; and from two to five pairs of false legs or prolegs, as they have been called, short and thick, and armed at the extremity with hooks, which enable the creature to fasten itself to the branches of trees, &c. Most of these caterpillars walk forwards, as other animals generally do, but some, as in the genus *Tortrix*, walk backwards, with a kind of leaping motion. Others bend the body in form of a loop, and suddenly straightening themselves, move with a sudden bound. During their progress to maturity, they change their skin several (generally four) times, and it is during this stage of their existence that they commit the mischief to plants and trees, &c., for which many of them are so famed. When full grown, the larvæ prepare for another change. They cover themselves with a particular kind of envelope, cease feeding, become immovable, and then change into the form of *chrysalis* or *pupa*. Some of them spin a cocoon of silk or other materials for their pupa case; others form a sort of membranous covering, which soon becomes hard and friable, and the insect lies immovably enclosed within it like an Egyptian mummy—hence the name of *pupa*. In this case the development of the creature progresses, till the period arrives for becoming a perfect insect or *imago*, when it bursts its case longitudinally and makes its escape. At first, with its wings moist and unexpanded, it appears weak and feeble, but soon after it is exposed to the air, the wings become dry and extended, and the insect appears full of life and animation. The number of known species of *Lepidoptera* is very great. They are supposed to be about 12,000, or nearly one-sixth of the whole of the insect tribes. Upwards of 2,000 are described as British alone. The beauty and elegance of the majority of the perfect insects, and the extreme degree of interest attached to many while in their larva and pupa state, have made this order a great favourite with entomologists. The damage done by the destructive powers of the larvæ of many seems to be almost compensated by the commercial value of the silk cocoons of the pupæ of others. See BOMBYX. This great order of insects has generally been divided into three large sections—*Diurna*, or those which fly by day, as the true butterflies; *Crepuscularia*, or those which fly in the evening; and *Nocturna*, or those which fly at night, as the true moths. As many of the nocturnal lepidoptera, however, fly by day, and *vice versa*, another arrangement has been adopted, based upon the structure of the antennæ. The butterflies are characterized by their antennæ being club-shaped at the extremity, and are contained in the great group *Rhopalocera* (club-horned), whilst the moths are characterized by their antennæ never being club-shaped at the extremity, but being generally setaceous, filiform, fusiform, or pectinated; these are contained in the equally large group called *Heterocera* (varied-horned.)

Lepidosiren. *Mud-Eel.*—A genus of animals which has been the subject of much scientific controversy as to its station in the animal scale; some naturalists placing it in the class *Reptilia* or reptiles, and others in the class *Pisces* or fishes. By Bischoff, and in the British Museum catalogue, by Dr. Gray, it is placed in the class *Reptilia*, division *Amphibia*, order *Pseudoichthyas*, and family *Lepidosirenidæ*. By Professor Owen, Sir John Richardson, and others, it is placed in the class *Pisces*, order *Protopteri* or *Sirenoidei*, and family *Sirenidæ*. Great stress has been laid upon one character as a means of separating the amphibious reptile or batrachian from the fish. This is the possession, in the former, as may be seen in the toad, frog, or salamander, of two nostrils, one external, the other internal opening into the mouth. According to Dr. Gray, the lepidosiren possesses this character; and he asserts that the inner nostrils may be seen in the living animal when it opens its mouth to take in air. From his observations of the living specimens at the Crystal Palace, he says that they appear to take in water by the nostrils, and at the same time to respire both air, as batrachians, and water, as fish. Professor Owen, on the other hand, maintains, that neither of the nostrils communicates with the mouth. The animal, he says, has an elongated nasal sac, with the biserial pituitary folds usual in fishes; and this nasal sac is placed in the under part of the thick lip, a position which has caused the mistake of those naturalists who affirm that the posterior opening is within the mouth. The lepidosiren is one of the most perfectly amphibious animals in existence. Its organs of respiration are twofold. First, it has well organized gills on the inner edge of the branchial arches, as in fishes, and a regular gill cover, with a small, oblong aperture in front of the base of the anterior members. In the second place, it has two well developed cellular lungs of nearly equal size. These lungs are analogous to those organs in the amphibia; but by Owen, &c., they are considered to be merely a modification of the air-bladder possessed by most fishes. The body of the animal is elongate, fish-like, covered with oval imbricated scales, and furnished with dorsal and caudal membranes, resembling fins, strengthened with soft jointed rays. It has four members, two anterior and two posterior. These, according to the supporters of the reptilian theory, are rudimentary feet; but according to the advocates of its ichthyac character, are pectoral and abdominal ventral fins, in the form of single, slender, tapering barbels, supported internally by a soft cartilaginous ray. There are two species known, one from the Amazon, *L. paradoxa*, the other from the Gambia, *L. annectans*. Of this latter species, several liv-

ing specimens have lately been brought to this country. The river Gambia, in the rainy season, floods extensive tracts of country, and upon the water retreating, after the rains have ceased to fall, the lepidosirens that are left behind burrow

Lepidosiren paradoxa.

into the mud. In this, which the sun soon converts into a hard cake, they form a sort of case or cocoon for themselves, in which they remain torpid and clothed in a thick secretion of mucus, until the rains again overflow the muddy lands and release them to the enjoyment of their swimming powers. It was in these hard cocoons that the specimens lately exhibited alive in the Crystal Palace, were brought over to this country. The natives eat these animals. When fried, they resemble eels in taste, and have a rich, oily flavour. The American species, *L. paradoxa*, or caramuru of the natives of the banks of the Amazon, attains a length of between two and three feet, and is found in several of the large rivers of Brazil and other parts of South America. It has fifty-five pairs of ribs, while the African species has only thirty-six.

Lepidosteidæ.—A small family of fishes belonging to the order *Ganoidei*, and forming the type of that order. The family contains very few species, and only one genus, *Lepidosteus* (*or Lepisosteus*), which see.

Lepidosteus (λεπις, a scale; οστεον, a bone). *Bony Pikes.*—A genus of malacopterygious fishes chiefly belonging to the family *Clupeidæ*, but now forming the type of the family *Lepidosteidæ*, and remarkable for the hard, bony scales with which they are covered. The body is, as it were, encased in these, and the two outer rays of the tail and of the fins are fringed with them. Three or four species are known inhabiting the lakes and rivers of the warm parts of South America. When full grown, they afford good food. The scales with which these fishes are covered are of the *ganoid* type, and form a defensive armour, impenetrable to the attacks of their aquatic enemies. Along with the genus *Polypterus*, forming the type of the small family *Polypteridæ*, these fishes are the living representatives of numerous fossil species of voracious ganoid fishes found in the secondary strata, such as the genera *Lepidotus*, *Palæoniscus*, &c., &c.

Lepidostrobus.—Fossil species of cones. See LEPIDODENDRON.

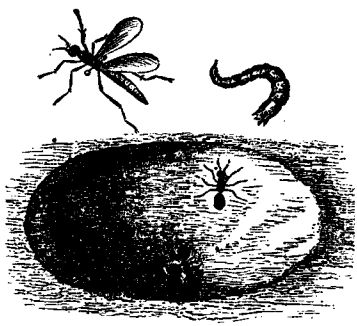
Lepidotus.—A genus of fossil fishes. See LEPIDOSTEUS.

Lepisma (λεπιζω, to scale off).—A genus of annulose animals belonging to the order *Thysanura*. The species are elongated, flattened insects, having the body covered with fine brilliant scales, shining like powdered silver. *L. saccharina*, sometimes called the sugar louse, is the most common species, an active little creature with setaceous antennæ, and three long filaments projecting from the extremity of the abdomen. It runs fast, and is generally found in houses in places where sugar and sweetmeats are kept, in the cracks of old window frames, under damp boards, &c. Its chief food consists of sugar and articles of that nature, but it is said also to eat small insects, especially the little acari found in old books, wood, &c., and commonly called wood lice. Its habits are nocturnal. The beautiful silvery scales which cover its body are used by microscopists as test objects.

Leporidæ. *The Hare family.*—A family of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and characterized by their having two small teeth behind the upper cutting teeth, and five rootless grinders, each formed of two plates, in both jaws. They have large eyes, placed laterally, long ears, a hairy tongue, an incomplete clavicle, weak fore feet, and a very short and hairy tail. The head is rather large, the muzzle thick and covered with short silky hairs, and the upper lip is cleft as far as to the nostrils. They are gentle, timid animals, easily frightened at the least noise, and are possessed of remarkable quick hearing. Their mode of progression is by leaping, and when alarmed their flight is very rapid. They live upon vegetable food, as the young shoots and bark of trees, growing corn, &c. They are extremely prolific, and their numbers would soon prove a source of immense injury to agriculturists, were they not kept under by various enemies. Foxes and wild cats destroy many; but their most redoubtable enemy is man, who finds them excellent eating, whilst the chase affords capital sport. They exist in all parts of the world, and are found from the equator to the poles. The genus *Lepus* is the type of the family, and the common hare, *L. timidus*, may be regarded as the type of the genus. The hare lives upon the ground, beneath some bush, or in a furrow, or other slight shelter. The place where it rests is called its *form*, and in this it keeps close during the day, seeking its food only by night. The young are called *leverets*, and they are born with their eyes open. When the hare is hunted with the greyhound, the chase

is called *coursing*, and forms an exciting and favourite sport with country gentlemen. Great numbers are annually killed in this country, for their flesh is excellent, and much esteemed. The skin is used as an article of furriery. The Romans prized the hare very much as an article of food; but it was forbidden to the Jews, Mohammedans, and, it is said, to the ancient Britons. Hares are found abundantly throughout all temperate Europe, in Asia Minor, and Syria. A good many species are known, but they resemble each other so much, that it is difficult to distinguish them. *L. hibernicus*, the Irish hare, is now considered a distinct species, and is the only one found in Ireland. *L. variabilis*, the Scotch or varying hare, or Alpine hare, inhabits the mountainous regions of Scotland, and is found in Norway, Sweden, Lapland, Russia, &c. It changes the colour of its fur in winter, becoming at that season quite white. In size, it is intermediate between the common hare and the rabbit. *L. ruficaudatus*, the Indian hare, is a native of Bengal and Nepal; *L. Egyptius* is found in Egypt; *L. Americanus*, the American hare, is a native of North America, from Canada to the Gulf of Mexico; *L. Capensis* is a native of the Cape of Good Hope. Many other species, all bearing a strong family resemblance, are found in other parts of the world. The rabbits differ considerably in their habits from the hares; and they have by some naturalists been raised to the rank of a genus. The common rabbit, *L. cuniculus*, is the best known species, and is even more abundant than the hare. It has more social habits than that animal, and lives in society, forming a burrow, which it digs in sandy places, or little hills, or in woods. These burrows are often very extensive, and the place where they occur and where numerous individuals are found living together, is termed a warren. The fecundity of the rabbit is extremely great; they breed seven times a-year, and bring forth eight young ones each time. In four years, a single pair would thus be the progenitors of 1,274,840! The young, unlike the hares, are blind at their birth. The flesh of the rabbit is much esteemed, and affords a valuable article of food to man, and the fur forms a considerable article of trade. When frightened, it has the curious habit of striking with violence on the ground with its hinder feet. Great quantities of rabbits are kept in a state of domesticity, and are easily tamed. Originally a native of Africa, the rabbit has been introduced into all the countries of Europe, where it has become completely naturalized. A good many species are known. A distinct species, *L. vernicula*, the Irish rabbit, is found in Ireland; *L. arenarius* is found at the Cape of Good Hope; *L. Magellanicus* is a native of the Straits of Magellan; and others occur elsewhere. Fossil remains of the hare family have been found in the bone caves of Yorkshire, &c. The genus *Lagomys* belongs to this family, and contains several species, amongst which is one known as the calling hare. See LAGOMYS.

Leptidæ.—A family of dipterous insects, the species belonging to which are of moderate size, and generally varied in their colours. They frequent the trunks of trees, especially preferring the sides exposed to the sun. The females deposit their eggs either in the earth or in vegetable mould. The larvæ are elongate, apodal, sub-cylindrical grubs, and one species is very remarkable for forming pitfalls for the purpose of taking its prey. The perfect insect, *L. vermileo* (=*Vermileo Degeerii*), is a little fly about four or five lines



Leptis vermileo—Pitfall, Larva, and perfect insect.

in length, of a yellow colour, with black streaks and spots upon the body. The larva is a dirty white worm-like creature, about eight or nine lines in length, and of a cylindrical form. They are found in Provence, environs of Lyons, and at Auvergne, at the foot of old walls or rocks, where they find a fine sandy soil. In this they dig a pit, the insect throwing the sand up in the air in an oblique direction, making it fall at some distance from the place from which it was taken. When this pit is deep enough, it places itself at the bottom, and remains perfectly still, like a little bit of stick, till some prey comes in its way. The moment an ant, a fly, or a worm tumbles down into this pit, this immovable looking piece of stick immediately rushes out to the attack. The body being flexible, it twists itself round its prey, and thrusting its proboscis into the substance of its body, it soon kills the poor creature it has entrapped, and sucks its juices. Sometimes its prey escapes from its grasp, and tries to climb up the steep slope of the pit. A shower of sand, however, is immediately sent after it, and the poor victim overwhelmed falls back into the pit. This larva is three years in attaining its full growth, and the pupa, instead of forming a cocoon, remains in its larva skin, at the bottom of its pit, for ten or fifteen days, at the end of that time assuming the perfect form.

Leptoconchus (λεπτος, thin; κογχος, a shell).—The young of a genus of gasteropodous mollusca. See MAGILUS.

Leptolepis.—A genus of extinct fossil fishes belonging to the ganoid order, and found in the lias.

Leptonix.—The sea leopard. A synonym of *Stenorhynchus*. See PHOCIDÆ.

Leptophina.—A sub-family of serpents belonging to the family *Colubridæ*, and composed of the two genera *Leptophis* and *Dryinus*. Several species are known, all of them living in woods, very graceful in form, and bright and changeable in colours. They entwine themselves amongst the branches of trees, gliding with great rapidity and elegance from one to another, and live upon large insects, young birds, &c. They are perfectly harmless, and children twine them round their necks and arms, the serpents appearing, it is said, much pleased with being caressed.

Leptoptilos.—A genus of birds, to which the adjutant, or gigantic crane of India belongs. See ARDEIDÆ.

Leptospermum (λεπτος, slender; σπερμα, seed).—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, and comprising about thirty species of shrubs or small trees growing in Australia and New Zealand. Several of the species are used in infusion as a substitute for tea. The leaves of *L. flavescens* are remarkable for their pleasant taste and aromatic odour, and were used by Captain Cook and his companions, in one of his early voyages, as a remedy in cases of scurvy.

Leptus.—A genus of minute insects. See ACARIDÆ.

Leptynite. *Whitestone.*—A form of granite, sienite, or gneiss, deprived of their mica, quartz, and amphibole, and with only felspar remaining. It is also called *Granulite.*

Lepus. *The Hare.*—See LEPORIDÆ.

Lernea.—See LERNEIDÆ.

Lerneidæ.—An order of parasitic animals belonging to the entomostracous *Crustacea*. The species are tolerably numerous, and for the most part are very bizarre and extraordinary in their appearance. Their external figure is, indeed, so highly fantastical that we are disposed to admire the freaks of nature in bringing forth such forms. Their mouth is generally in the form of a blunt spherical snout, placed on the most advanced portion of the head, and terminating in a rounded opening. They are all strictly parasitic upon fishes, and other aquatic animals. They attach themselves to their prey by means of organs called *jaw-feet*, or maxillipeds, or burrow deep into the very substance of the animals they live upon. They have no eyes, and their feet are almost rudimentary when present, though, indeed, they are often altogether wanting. Immovably fixed upon the fishes which serve them for food, they require neither feet to transport themselves from place to place, nor eyes to guide them in their search for fresh abodes. The females have large external ovaries, which contain numerous eggs, and the animals are often so deeply fixed in the tissue of their hosts, that little else but these ovaries are visible externally. When fresh hatched, the young resemble very much those of the cyclopidæ. They possess a large eye, two pairs of swimming feet, and antennæ. They are then nimble and active, and swim freely in the water. They change their skin frequently, and go through, no doubt, many stages of development before they assume the mature form. As soon as they attach themselves to their prey they lose their eye and their swimming feet, as they are no longer of any use to them. The males are very dissimilar in appearance to the females; they are much smaller, and are constantly found adhering to the females. The genera are numerous. Some are fixed by means of the jaw-feet attached to their mouth, which are stout and armed with strong hooks. These are termed the *Anchorastomacea* (αγκυρα, anchor; στομα, mouth), see CHONDRACANTHUS. Others are attached by means of long arm-shaped appendages springing from the thorax, united to each other at the tip, and terminating in a horny button in the centre. These are called *Anchoracarpacea* (αγκυρα, anchor; καρπος, arm), see LERNEOPODA. A third set are attached by means of the head itself, which is furnished with one or more pairs of horn-shaped appendages projecting laterally. These are called *Anchoraceracea* (αγκυρα, anchor; κερας, a horn). The genus *Lernea* is the type of this group, and gives its name to the order. This genus is restricted to those species which have the body curiously twisted in form, and the head furnished with horn-shaped and irregularly branched appendages. They attach themselves to the fishes upon which they live, by plunging their whole head into the substance of the body of their prey, and they cannot be removed without force, and tearing the horn-shaped appendages from their head. One species, about an inch and a-half in length, *Lernea branchialis*, is found adhering in this manner to the gills of the common cod-fish. When touched it squirts from the vent a transparent fluid to the distance of a foot and a-half, and this it will repeat several times successively.

Lerneopoda (λερναιος, belonging to lernea; πους, a foot).—A genus of parasitic *Entomostraca*, belonging to the order *Lerneidæ*. The animals belonging to this genus affix themselves to the body of their prey by means of two long appendages which arise from the thorax. These are wide apart from each other at the base, and unite at the tip, forming there a sort of horny knob, like a button. When this is buried in the flesh of the fish upon which they live, it becomes a strong attachment, and indeed the animal cannot be separated without its being torn, unless carefully dissected out. Most probably the young animals, when fully matured, and ready for assuming their position as parasites, first fasten themselves to their prey by their jaw-feet, and these become transformed into those peculiar organs. A species, *L. elongata*, was found by the arctic voyager Scoresby, attached to the eye

of the Greenland shark, the appendages buried in the substance of the eye to nearly a fourth part of their length. The sharks apparently became blind in consequence of the wound caused to the organ of sight, for the sailors observed that they paid not the slightest attention to the presence of a man, and never drew back from him when a blow was aimed at them with a lance or knife.

Lestris.—A synonym of *Stercorarius*. The arctic and Skua gulls. See LARIDÆ.

Lethrus.—A genus of beetles. See GEOTRUPIDÆ.

Leuciscus.—A genus of malacopterygious fishes belonging to the family *Cyprinidæ*, distinguished from the rest of the family by the comparative shortness of the dorsal and anal fins, and the want of strong spiny rays at the commencement of them both. Many of the species are well known fishes, and all of them are inhabitants of fresh water, and considered excellent eating. The roach, *L. rutilus*, about twelve to fifteen inches in length, is common in England, and most parts of Europe, swimming in large shoals, frequenting still rivers and lakes, and feeding upon worms and aquatic vegetables. The dace, *L. vulgaris*, is longer and more slender than the roach, but has nearly the same habits. It is found in the deep clear water of quiet streams in this country, as well as many other parts of Europe. The graining, *L. Lancastriensis*, the chub, *L. Cephalus*, the rud, or red eye, *L. erythrophthalmus*, and the azurine, *L. cæruleus*, a very pretty fish, are all found in the fresh waters of this country. The minnow or minim, *L. phoxinus*, is the smallest of all the species, and is a well known inhabitant of almost all our streams. The bleak, *L. alburnus*, is, however, perhaps the most interesting species of them all. It is a small fish, seldom exceeding six inches in length, and in some places is most abundant, swimming in great shoals, and occurring in the same kind of streams as the roach and the dace, along with which it is generally found. The scales of the body are slender, and on their inner surface is found a silvery pigment, which is known by the name of "essence of pearl." This substance has long been used in the manufacture of artificial pearls. It is procured by soaking the scales in water for some time, and allowing the pigment to fall to the bottom. This "essence" presents the appearance of a very brilliant bluish-white substance, like that of the finest pearls or purest nacre. The pearls themselves are small, thin, hollow, glass beads, and a drop of this pigment, well washed, and suspended in a solution of finely clarified isinglass, is injected into the bead, which is then shook in all directions so as to spread the pigment over the internal surface. The bead is then dried rapidly, and when greater weight and firmness are required, a little melted wax is injected. At one time these artificial pearls were very much used in the bead trade for necklaces, ear drops, &c., but at the present time they are nearly confined to ornaments attached to combs, &c., for head-dresses. This "essence of pearl" is obtained in like manner from the scales of the roach, dace, and other species of this genus, and more particularly still from the little fish called white bait, *Clupea alba*; but by far the greater part used by bead manufacturers was procured from the bleak.

Leucite. *White Garnet*, or *Amphigene.*—A mineral occurring in crystals in the form of a modification of the octohedron, and found imbedded in lava and in basalt. Its specific gravity is 2·49. It is composed of silica, alumina, potash, and oxide of iron.

Leucophrys (λευκος, white; οφρυς, eye-lash).—A genus of minute animals, not as yet properly defined, but at present arranged amongst the infusoria. They are exceedingly small, and are of a depressed oval form. They appear to be destitute of mouth, and have the body covered with long vibratile cilia disposed in numerous parallel rows. They live parasitic in the bodies of worms, between the intestine and muscular envelope.

Leucosia. } —A genus and family of
Leucosiadæ. } short-tailed decapodous *Crustacea*, containing many very pretty species. See BRACHYURA.

Lherzolite.—A rock found in the Pyrenees, near the lake Lherz, of a green colour, and when compact resembling serpentine. It is harder than that rock, and is composed of a granular or lamellar pyroxene.

Libellula. *The Dragon Fly.*—See LIBELLULIDÆ.

Libellulidæ.—A large family of insects belonging to the order *Neuroptera*, and containing numerous species which are characterized by having large and strongly reticulated wings, the posterior being nearly the length of the anterior; a large head, with enormous eyes and small antennæ; and a long body, with very hard integuments. They are, generally speaking, of a large size, exceedingly powerful and swift of flight, of very elegant appearance, and having brightly coloured wings. About 400 species have been enumerated, scattered over the whole globe, and for the most part found in the neighbourhood of water. They are carnivorous and very voracious, and their general appearance and ferocious habits have acquired for them the name of dragon flies. In France they are likewise called, from the grace and beauty of many of the species, "demoiselles." The larvæ of the dragon flies are aquatic. The females deposit their eggs in the water, and the larvæ, which are not long in being hatched, live about a year before acquiring their full growth. They are as repugnant to the look as the perfect insects are attractive. Slow in their movements and generally covered with slime and mud, they present a heavy ungraceful appearance, and look as if it would be difficult for them to procure their food. Nature, however,

has made amends for their slow and heavy gait by the structure of their lower lip. In a state of repose this organ, which is armed at the extremity with a pair of triangular, strongly toothed plates, covers the mouth, but when the insect chooses, it can project it out to a great length and seize its prey. The pupæ are active, and, contrary to the usual habits of insects, move about in the water. When nearly arrived at the period for becoming perfect insects, these pupæ creep up the stem of some aquatic plant or stone, and after remaining fixed there for a few hours, the skin of the thorax begins to slit, and the imago gradually unfolds itself. The species are arranged in two subfamilies, *Libellulides* and *Agrionides*, represented, the first, by the genera *Libellula* and *Æshna*, and the second, by the genus *Agrion*. One of the most common, and perhaps the largest British species, is the great variegated dragon fly, *Æshna varia*, which makes its appearance principally towards the end of summer, and is three inches long from head to tail, and measures four in expanse of wings. In the day time it flies about in pursuit of its prey with astonishing rapidity, and is held in no small terror by many people. In Scotland it is well known by the name of the "flying adder."

Lichanotis.—A synonym of *Indris*. See LEMURIDÆ.

Lichenes. — *The Lichens.* See THALLOGENÆ.

Lichina.—A genus of acotyledonous plants belonging to the angiocarpous *Lichens*. They are plants of a remarkable habit, and as they grow on marine rocks, they were formerly classed amongst the *Algæ*. The branched thallus is of a gelatinous texture, very soft when wet, but becoming cartilaginous when dry.

Lignite (*lignum*, wood).—A variety of coal found in the tertiary formations, and composed of carbon, hydrogen, and oxygen, the oxygen being in greater proportion. It is formed of ligneous vegetable fibres in a fossil state, and burns freely. There are several varieties. One is the *Pechkole* of Werner, or pitch coal, to which the substance known as *Jet* belongs. Jet is well known as an article of commerce, from the facility with which it takes a high polish. It is in consequence much used for ornamental purposes, especially for articles worn by ladies in mourning. In Prussia it is called black amber, and is cut into rosaries and necklaces. Lignite often occurs in beds of considerable thickness and extent, and supplies to particular districts an inferior kind of coal. In France this kind of coal is used to a very considerable extent. It gives occupation to many workmen, and is calculated to produce 500,000 francs annually.

Ligula.—A curious genus of *Entozoa* or intestinal worms, which first make their appearance in the intestinal canal of fishes, but do not reach their full development till they have been swallowed and taken into the stomach of certain birds. They are of an elongated form, white, soft, or parenchymatous, very long, flattened in form of a tape, without distinct articulations, and sometimes without head or distinct organs. In this simple form they are found in the intestines of some fresh water fishes belonging to the genus *Cyprinus*, and are so abundant in these fishes in some lakes in Italy that the inhabitants collect them as an article of food, which they hold in high estimation. When these curious creatures are swallowed by the birds which prey upon the fresh water fishes, they then become, in their intestines, more completely developed. The head becomes more distinct, and the various organs are formed. Several species have been described occurring in the heron, the grebe, diver, &c.

Ligula.—Used formerly to designate a genus of shells, but not now employed by conchologists.

Ligustrum. *The Privet.*—A genus of dicotyledonous plants belonging to the nat. ord. *Jasminaceæ*, containing a number of species of shrubs or low trees, natives of Europe and Asia. The common privet, *L. vulgare*, is the best known species, and in point of utility and ornament few shrubs exceed it. Its chief use is to form hedges, and its English name appears to be derived from its being frequently planted to conceal private places. The wood is hard, and fit for timber, and from the pulp of the berries a rose coloured pigment may be prepared, which, with the addition of alum, dyes wool and silk of a good durable green.

Liliaceæ. *The Lilies.*—A large and important nat. ord. of monocotyledonous plants, comprising 133 genera and 1,200 species. They are for the most part beautiful herbaceous plants, with bulbous roots and elegant flowers. A few, however, are shrubs and trees, such as the genus *Dracæna*, or dragon tree, which contains species with a stem many feet in diameter. See DRACÆNA. The leaves of the plants of this family are simple, entire, and sheathing the stem at the base. The flowers are solitary, or united into various kinds of inflorescence, and are accompanied with bracteæ, which often constitute a spathe. The species are scattered over the whole surface of the globe, but are most abundant in the temperate and sub-tropical parts of the Old World. The tulips inhabit chiefly the temperate regions of the western hemisphere. The agapanthes are principally found under the tropic of Capricorn. The aloes are almost exclusively natives of the Cape of Good Hope, a few only being found in Asia and America. The asphodels, the most numerous of all the tribes, are either natives of the temperate regions of the western hemisphere, such as the shores of the Mediterranean, or of the Cape of Good Hope and Australia. Among the numerous species of this family many are useful to man, as well as ornamental. In the list of economical plants we may merely mention the genus ALLIUM, containing the onion, leek, &c., &c.; the genus ASPARAGUS, containing the well

known esculent of that name; the CORDYLINE of the Sandwich Islands, which furnishes an edible root; and the genus PHORMIUM, which has of late become so well known as furnishing the New Zealand flax. Amongst the medicinal plants of the family are the genus ALOES, so much esteemed for its purgative resin; the YUCCA, which furnishes a cathartic extract; the genus SCILLA, which furnishes the *Squills* of the shops; and the DRACÆNA, which furnishes the dragon's blood. As ornaments for the garden, and the cultivation of which forms a very considerable article of commerce, we may enumerate the genus TULIPA, so well known as containing the beautiful flowers called tulips; the genus HYACINTHUS, producing the varied kinds of hyacinths; and the genus *Lilium*, which is the type of the order, and gives it its name. This genus contains many beautiful species, which give great attractiveness to our gardens. They are all possessed of bulbous roots, and a simple straight stem, carrying on its summit one or more very beautiful and sometimes large flowers. Some have the perianth leaves sessile, *not* clawed at the base, and revolute; such are the martagon lily, *L. superbum*, the Turk's cap lily, *L. martagon*, the tiger lily, *L. tigrinum*, and several others. Others have the leaves of the perianth clawed at the base, such as the pretty American lily, *L. Philadelphicum;* whilst a third set have the leaves of the perianth campanulate, such as the orange lily, *L. bulbiferum*, and the white lily, *L. candidum*, which is the most common species of all, and the most widely diffused. The bulbous roots of this species are bitter to the taste. This, however, disappears by cooking, and then they form in some parts of Asia an article of food. When boiled soft, they are applied as emollient cataplasms for boils and suppurating wounds. From the flowers an agreeable oil is obtained, which was at one time used in medicine, and perfumers now extract the aroma, and use it as a perfume. *L. chalcedonicum* is a most abundant species in Syria, covering the entire plains with its scarlet flowers, and is worthy of note as being the "lilies of the field," so beautifully alluded to by our Saviour in his sermon on the mount.

Lilium.—*The Lily.* See LILIACEÆ.

Lima.—A genus of bivalve mollusca. See PECTENIDÆ.

Limacina.—A genus of molluscous animals belonging to the class *Pteropoda*, and forming the type of a family *Limacinidæ*. The shell of the animals belonging to this family is minute, spiral, sinistral, sometimes operculate, and the animals have fins attached to the sides of the mouth, and united ventrally by an operculigerous lobe. They inhabit the arctic and antarctic seas, and form a considerable portion of the food of whales.

Limax. *The Slug.*—A genus of molluscous animals belonging to the inoperculate pulmoniferous *Gasteropoda*, and commonly known by the name of slugs. Several of the species, as the common gray slug, *L. cinereus*, the variegated slug, *L. variegatus*, &c., are very great pests to the garden. They deposit their ova at any time of the spring and summer when the weather is moist, and bury themselves in the earth in drought and frost.

Limnæidæ (λιμναιος, marshy). *The Pond Snails.*—A family of molluscous animals belonging to the inoperculate pulmoniferous *Gasteropoda*, and containing many species which are characterized by having thin horn-coloured shells, capable of containing the whole animal when retracted. They inhabit fresh water, and are found in all parts of the world. They have the power of floating on the surface of the water, with the back downwards, the concave surface of the foot forming a kind of boat. They feed chiefly on decaying leaves. The genus *Lymnæa* is the type of the family, and the species are tolerably numerous. Several are found in this country. The shell is spiral, more or less elongated, thin, translucent, the body whirl large, aperture rounded in front, and the columella obliquely twisted. See LYMNÆA. The genus *Physa* has the shell sinistral. *Planorbis* has the shell discoidal, dextral, many-whirled. These are found in many parts of the world, but the genus *Chilina* is peculiar to South America. Many fossil species of *Limneidæ* are found, especially in the wealden.

Limnochares.—A genus of spiders, belonging to the order *Acaridæ* and family *Hydrachnidæ*. This genus contains only one species, *L. aquatica*, which differs from the rest of the family by walking instead of swimming. The larvæ attach themselves to the head of the hemipterous insect *Gerris lacustris;* but subsequently fall off, and pass their pupa state under submerged stones, the perfect insect appearing at the end of fifteen days.

Limnoria.—A genus of sessile-eyed *Crustacea*, belonging to the order *Isopoda*, and containing only one species, *L. terebrans*, which is very small, seldom exceeding $\frac{2}{10}$ths of an inch in length. The body is composed of fourteen segments, the two last being much larger than the preceding, and the animal can roll itself up in the form of a ball. The mouth is furnished with two pairs of jaws, and a pair of strong mandibles, which are about $\frac{6}{10}$ths of an inch in length, and form powerful boring organs. The *Limnoria* inhabits the ocean and its shores, dwelling in holes in wood, which it forms for itself. It is gregarious, and very abundant in some situations. Its food consists of the wood into which it bores, and thus it becomes very destructive to timber forming piers, dock gates, &c. The ravages committed by this little creature are very great, and were first observed particularly by the late Mr. Stephenson, the engineer, while engaged in the erection of the Bell Rock lighthouse. Since then it has been noticed in several other parts of our coasts, and has been the cause of most serious

injury to piles of wood supporting various useful erections on the shores of the sea. The galleries which it forms in the wood are tortuous, and run in all directions, though generally the animal bores upwards at an angle of about 45°. By being thus bored throughout its substance, the wood becomes so disintegrated, that the sea washes away its surface, layer after layer, and the whole piece of timber is soon destroyed.

Limosa. *The Godwit.*—A genus of birds. See SCOLOPACIDÆ.

Limosinæ.—A sub-family of birds. See SCOLOPACIDÆ.

Limulus. *The King Crab.*—A genus of *Crustacea*. See XIPHOSURA.

Linaceæ. *The Flax family.*—A small nat. ord. of dicotyledonous plants, consisting of only two genera, *Radiola* and *Linum*. The first genus contains few species, and none of them plants of any importance; but the genus *Linum* contains a considerable number, and one species, *L. usitatissimum*, is a plant of great commercial value. This is the common flax, from the fibres of which we obtain our linen cloth and cambrics. The flax is supposed to have been originally a native of Egypt, and it is now ascertained that mummy cloth is formed of linen. The manufacture of linen cloth is carried on to a very considerable extent in Ireland and Scotland. The town of Dundee is the chief seat of this branch of industry in the latter country, and of late years has alone manufactured about as much linen cloth as all Ireland. In 1833, the imports of flax to that town amounted to 18,777 tons, and the shipments of linen, sailcloth, &c., were valued at about £1,600,000! Mr. Macculloch calculates the value of the linen manufacture in Great Britain and Ireland to be about £7,500,000, and to provide employment for about 172,000 workmen. The seeds of the flax contain a great quantity of fixed oil, which is of considerable value. Linseed oil is used for burning in lamps, and as a drying oil in the arts. It is procured by expression, and after it is obtained, a cake remains, called oil cake, which is extensively used for fattening cattle. The celebrated Carron oil, so extensively used in cases of burns, is composed of linseed oil, mixed with lime water, and the powdered cake, called linseed meal, is commonly used for making poultices.

Linaria. *The Toad Flax.*—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*. The species are very pretty plants, and are well suited for the flower garden, but are not possessed of any virtues of importance. Several are natives of Great Britain, one of the most particular of which is the common toad flax, *L. vulgaris*. The flowers are large and of a yellow colour, and the plant is called in Worcestershire and Berwickshire butter and eggs. It abounds in an acrid oil, which, when united with milk, is a poison to flies.

Linaria. *The Linnet.*—A genus of birds. See FRINGILLIDÆ.

Lingula.—A genus of molluscous animals See BRACHIOPODA.

Linnæa.—A genus of plants named after Linnæus. See CAPRIFOLIACEÆ.

Linota.—A synonym of *Linaria*, the linnet. See FRINGILLIDÆ.

Linum. *The Flax.*—A genus of plants. See LINACEÆ.

Liquidambar.—A genus of plants containing a balsam known by the same name. See BALSAMACEÆ.

Liriodendron (λειριον, a lily; δενδρον, a tree). *Tulip Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Magnoliaceæ*. The only species of the genus is the tree known by the name of the tulip tree. It is one of the most magnificent trees of the forest of the temperate parts of North America, having large four-lobed truncate leaves resembling a saddle in shape, and large elegant flowers, coloured with green, yellow, and orange. The stem rises to a height of from 70 to 100 feet, and measures from 18 inches to 3 feet in diameter. Occasionally they are found 120 feet high, and 20 feet in circumference. The tulip tree is cultivated in Europe, and thrives well in most parts. In America it is called white wood, canoe wood, tulip-bearing lily tree, and Virginian poplar. The wood of the tree is light, compact, and fine grained, is easily wrought, and takes a good polish. It is used by the inhabitants for making furniture and the panels of carriages, and by the Indians for the construction of their canoes. The bark is bitter and aromatic, and has been substituted occasionally for cinchona bark.

Lithobiidæ. *Stone Centipedes.*—A family of annulose animals belonging to the class *Myriapoda*. See CHILOPODA.

Lithodomus (λιθος, stone; δομος, residence).—A genus of bivalve *Mollusca* belonging to the family *Mytilidæ*, and separated from the genus *Modiola* in order to contain those species which perforate rocks. The typical species is *L. lithophagus*, a shell commonly found burrowing in calcareous rocks on the coasts of the Mediterranean. It is much esteemed for its delicate flavour as an article of food, and is generally known by the name of the "sea date shell." About twelve or thirteen species are known, and some of them are luminous in the dark. Geologists have drawn some accurate conclusions with regard to the changes in the level of sea coast in modern times from the perforations of *Lithodomi* in rocks, &c. One of the most interesting instances of this is the case of the columns of the temple of Serapis, at Puteoli, which are perforated by these molluscs a considerable height above the present level of the sea.

Lithophagus (λιθος, stone; φαγω, to eat.)—A synonym of LITHODOMUS.

Lithornis (λιθος, stone; ορνις, a bird).—A genus of extinct fossil birds, most probably belonging to the *Accipitres*.

Lithospermum (λίθος, a stone; σπέρμα, seed).—A genus of dicotyledonous plants belonging to the nat. ord. *Boraginaceæ*, and containing several species of herbaceous uninteresting plants, two or three of which are natives of Great Britain. They are, however, remarkable for the stony hardness of their seeds, which have the bitterness and lustre of porcelain. The pericarp or membrane enclosing the seeds, when analyzed, is found to contain nearly sixty per cent. of earthy matter, which is more than is known in any other organized substance.

Lithotrya.—A genus of cirrhipedes. See LEPADIDÆ.

Litiopa.—A genus of molluscous animals belonging to the class *Gasteropoda*, and placed near the family *Littorinidæ*. There are very few species known. They are small shells, generally found living on marine plants, and especially abundant on the *Sargassum*, or gulf weed. The habits of these little animals are curious. They suspend themselves in the water by a fine mucous thread, which they attach to the plant upon which they live in much the same manner as the larvæ of some lepidopterous insects do. When suddenly alarmed they allow themselves to drop into the water, and the fine thread by which it is suspended elongates as the animal falls till it reaches about a foot in length. As soon as the cause of alarm has passed away they seize hold of the thread by their foot, and creep up it till they regain their place upon the plant.

Littorina (*litus*, the shore). *The Periwinkles.*—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of the family *Littorinidæ*. It contains many species which are natives of almost all parts of the world. The shells are turbinated, thick, few-whirled. The mouth is rounded and the operculum is horny, and few-spired. The species are all marine, living upon rocks between tide marks. The common periwinkle, *L. littorea*, is the best known species, and forms a considerable article of food among the poorer classes. Immense quantities are brought daily to the London market.

Lituites.—A genus of fossil cephalopodous *Mollusca*. See NAUTILIDÆ.

Lobelia.—See LOBELIACEÆ.

Lobeliaceæ.—A nat. ord. of dicotyledonous plants, consisting of numerous species which are either herbs or shrubs, abounding in a milky juice which is acrid and narcotic. In some of them this juice is so intense as to produce dangerous or even fatal consequences when applied to the surface of the body, or taken internally (see HIPPOBROMA), and in others sufficiently energetic to cause them to be used in medicine. The genus *Lobelia* is the type of the family, and contains upwards of 170 species which are generally herbaceous, rarely shrubby, and bearing variously coloured, often showy flowers. *Lobelia urens* is a native of England as well as of France, Spain, and Madeira. Its juice is sufficiently acrid and caustic to cause vomiting and purging accompanied with severe pains in the bowels. *L. syphilitica* is a native of the United States of America, and is frequently cultivated in our gardens as an ornamental plant. Its flowers are blue and violet, and the plant obtains its specific name from its having been employed as a remedy in syphilitic disorders. Its juice is not so acrid as that of some of the other species, and though its virtues do not now support its original character, yet it is employed occasionally as a sudorific, and when administered in large doses produces vomiting and purging. The most important species, however, is *L. inflata*, or Indian tobacco, a plant from six inches to two or three feet high, and growing in most parts of North America. The leaves, capsules, and root, possess an acrid and pungent taste, their action on the human system, when chewed, being nearly the same as that of tobacco, producing a copious flow of saliva, and if swallowed in a considerable dose, causing great relaxation of all muscular structures, including the heart and arteries, accompanied with debility, cold perspirations, and paleness of surface. When given in proper doses, lobelia has been found of great service in warding off, or cutting short a paroxysm of asthma, and has also proved beneficial as an expectorant and relaxant in hooping-cough. It owes its properties to a bitter principle called *Lobeline*. *L. fulgens* and *L. cardinalis*, both natives of America, and handsome plants, are two of the species most cultivated in our gardens.

Locustidæ = Acridii. *The Locust family.*—A family of insects belonging to the order *Orthoptera*, and containing several genera and many species. These insects are spread over all the globe, and generally in great numbers. Many of them multiply so rapidly, and to such an extent, that they destroy the produce of whole countries. Some of the exotic species are large, but the generality of those in Europe are rather small. They feed chiefly on leguminous plants. In spring and early summer they are in their larva state, and are destitute of wings. In the end of summer and autumn they become perfect insects, and ready to propagate their species. Many of the insects belonging to the order *Orthoptera* have the faculty of producing sounds, and the stridulating noise produced by the *Locustidæ* is well known. This sound is caused by the action of the hind legs upon the elytra or wing covers. These have the veins considerably elevated, and the inner edge of their thighs being rugose with spines, the rubbing of the one against the other effects the noise. The most celebrated species is the migratory locust, *Locusta migratoria*, a rather small insect, but perhaps one of the most formidable enemies that man has to encounter. Their powers of destruction are immense; and as they are produced in vast numbers, they soon destroy the vegetation in the spot where they were born. They then take flight in

great swarms to adjoining districts; and so great at times is the number of individuals of which the swarm is composed, that the sky is darkened during their passage, and the spots where they alight almost instantly assume the appearance of a barren wilderness. Even their destruction is itself a fresh source of danger, the air being filled for many miles with the putrefying effluvia of their decaying carcases. In several parts of central Europe, in Egypt, Syria, and almost all the south of Asia, these insects appear periodically (though in all probability more than one species have been confounded together under the same name), and have spread dismay and terror before them. In the south of Europe rewards are offered for the collection both of the eggs and perfect insects; and at Marseilles it is on record that, in the year 1613, 20,000 francs were paid for this purpose. In 1825, the same city paid a sum of 6,200 francs for destroying these pests to agriculture. In Turkey and in China a similar plan is adopted for the same object. In South Africa, a large species of locust, beautifully coloured, *L. cristata*, is very common, and in certain seasons dreadfully destructive. In some countries the inhabitants make use of the large species of locusts as food. They pull off their wings and legs, and fry them in butter or oil, or pickle them. The wild locusts upon which St. John fed have given rise to great discussion; some authors asserting them to be the fruit of the carob tree, while others maintain that they were true locusts, and refer to the practice of the Arabs in Syria at the present day.

Lodoicea. *The Double Cocoa Nut Palm Tree* of the Seychelles.—See COCOS.

Loganiaceæ.—A nat. ord. of dicotyledonous plants, containing a good many genera and numerous species, some of which are remarkable for the poisonous properties they possess. They are almost all trees or shrubs, very few being herbaceous, and nearly all of them are natives of the tropics or countries bordering upon them. They are sub-divided into three families—*Strychneæ*, of which the genus STRYCHNOS is the representative; *Spigelieæ*, of which the genus SPIGELIA is the type; and *Loganieæ*, represented by the genus *Logania*, the species of which are natives of Australia, and not of much interest.

Loligo. *The Calamary* or *Squid.*—A genus of cephalopodous *Mollusca* belonging to the section *Decapoda*, and family *Teuthidæ*. The body of these cuttle-fish is elongated, tapering behind, with a pair of terminal fins, and ten arms or feet. They have an internal dorsal plate, which is cartilaginous, and generally known by the name of a *pen*. About twenty-one species are known, inhabiting all seas from Norway to New Zealand. They are good swimmers, and they can also crawl, head downwards, on their oral disc. The common species, *L. vulgaris*, is abundant in the sea round Great Britain, and is used by the fishermen in the north, and in Cornwall, as a bait for cod. It grows to a length of nearly a foot and a-half. The ink contained in the ink bag is jet black. They live upon small molluscs and sea-weed, &c. Their egg-cases contain numerous ova, one cluster having been found to hold nearly 40,000 eggs. They are known by the name of sea or marine grapes. Two or three other species are natives of the seas of this country.

Lolium.—A genus of monocotyledonous plants belonging to the sub-class *Glumaceæ*, and nat. ord. *Gramineæ*. There are not many species, but one of them, the common rye-grass, *L. Perenne*, is one of the most valuable of all our pasture grasses, and highly esteemed by the agriculturist. The darnel, *L. temulentum*, is a poisonous species, and occasionally its accidental use has produced fatal consequences. It is a native of England, and is also found in most parts of Europe, Japan, Australia, China, and South America. The darnel is said to be the *tares* of Scripture, and is the only deleterious species belonging to the whole order.

Lolium temulentum—The Tares of Scripture.

Longicornes.—A tribe of tetramerous *Coleoptera*, characterized by the insects having antennæ as long as the body, filiform or setaceous. The species contained in this tribe are the largest and most graceful in form of all the beetles, and the larvæ of most, if not all, are inhabitants and eaters of wood, boring into trees, &c. The genera are very numerous, and are arranged in the families PRIONIDÆ, CERAMBYCIDÆ, and LEPTURIDÆ.

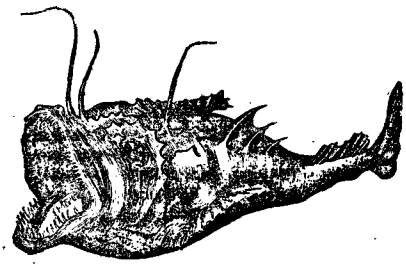
Longipennes (*longus*, long; *penna*, a feather or wing).—A tribe of birds adopted by some naturalists to contain such birds as the puffins, petrels, albatross, gulls, &c.

Longirostres (*longus*, long; *rostrum*, a beak).—A tribe of wading birds, used by some naturalists to contain such birds as the snipe, ibis, avocets, curlews, &c.

Lonicera. *The Honeysuckle.*—A genus of plants. See CAPRIFOLIACEÆ.

Lophiidæ. *The Anglers.*—A family of acanthopterygious fishes, distinguished by having the bones of the carpus or wrist elongated, so that the pectoral fins appear to be placed on an arm. Their skeleton is soft, nearly cartilaginous, and their skin destitute of scales. They are a voracious family of fishes, and from the small size of the opening of the gills, can live a long time out of the water. The genus *Lophius* is the type of the family, and the fish commonly known as the angler, or fishing frog, *L. pisca-*

torius, may be taken as the representative. This fish, which is usually about three feet long, has an enormous flattened head, forming the chief bulk of the body, and a tail so compressed on each side, that the creature seems composed of



L. piscatorius—The Fishing Frog.

little else than head and tail. Before the eyes are two long filaments, of a horny substance, which the animal can move at pleasure. Concealing itself amongst marine plants, or behind hillocks of sand, rocks, and stones, it erects the two long filaments, and wriggles them backwards and forwards with a motion resembling that of worms. Other smaller fishes in the neighbourhood are thus attracted by the bait to its hiding place, and fall an easy prey to its voracious appetite. The hideous appearance of its monstrous and almost constantly open mouth, well armed with teeth, has probably gained for the angler the vulgar name of *Sea Devil*.

Lophiodon.—A genus of extinct fossil pachydermatous animals, allied to the tapirs of the present day. The remains of a considerable number of species have been found in the tertiary strata, most of which occur in the eocene deposits of France, only one having been detected in England.

Lophius. *The Angler.*—A genus of fishes. See LOPHIIDÆ.

Lophophorus (λοφος, a plume of feathers; φορεω, a carrier).—A genus of birds belonging to the order *Gallinæ*, family *Phasianidæ*, and sub-family *Phasianinæ*, though by some ornithologists made the type of a small sub-family by itself, *Lophophorinæ*. They resemble the true pheasants in having the eye surrounded with a naked skin, and the peacocks, by having a crest of feathers on the head. Like both these groups, they have rich and varied plumage; but they differ from them both in the form of the tail. The upper mandible overlaps the lower, the cheeks are clothed with small feathers, and the tarsi are short and armed with spurs. The genus was founded on a beautiful species called the Impeyan pheasant, *L. Impeyanus*, a native of Nepal and the northern parts of India. It is a splendid bird, and one of the most beautiful of the order to which it belongs. The male has a tuft of feathers on its head, and the plumage of the upper part of his body is of a green colour, relieved with gold, purple, azure, and black. In

Lophophorus Impeyanus.

some parts of India it is known by the name of the "bird of gold." The Impeyan pheasants feed on bulbous roots, which they dig up by means of their bill.

Lophotes.—A genus of acanthopterygious fishes belonging to the family *Tæniidæ*, or riband fishes. The species are characterized by having a sharp crest surmounting the head, to the top of which is articulated a long compressed spine, arched and pointed, and resembling a true horn. *L. Lacepedii* is one of the largest fishes found in the Mediterranean, measuring upwards of five feet in length. It is, however, very rarely met with.

Lophyropoda (λοφυρος, having stiff hairs; πους, a foot).—A legion of entomostracous *Crustacea*. The animals belonging to the *Lophyropoda* are characterized by their feet being essentially organs of locomotion, and not branchial. These are few in number, and are composed of several articulations of a more or less cylindrical form; which are furnished with a series of stiff hairs or setæ. Their branchiæ or gills are attached to the organs of the mouth, and are few in number. They have only one eye. The body is either completely enclosed within a carapace, exactly resembling a bivalve shell, or partially covered by an envelope, shaped like a shield or buckler. They possess two pairs of antennæ, the lower of which are used by the animal as additional organs of locomotion. Some are natives of fresh water ponds and ditches, while others are inhabitants of the sea. This great division of the *Entomostraca* contains two orders—*Ostracoda*, represented by the CYPRIDIDÆ, &c., and *Copepoda*, represented by the CYCLOPIDÆ.

Lophyrus (λοφος, plume; ουρα, tail).—A genus of hymenopterous insects belonging to the

family *Tenthredinidæ*, and containing a few species which inhabit the temperate and cold regions of Europe and North America. The type of the genus is *L. (Tenthredo) pini*, the larvæ of which do a great deal of injury to the pine trees. In Franconia, a few years ago, several thousands of acres of pine trees were destroyed by these larvæ, and those of one or two other allied species.

Loranthaceæ.—A nat. ord. of dicotyledonous plants, the exact situation of which in the natural arrangement is still rather doubtful. The flowers, according to some, are destitute of corolla, the bright coloured leaves of the calyx or sepals taking the place of the petals. The species are tolerably numerous, and consist of shrubs which for the most part grow parasitic upon trees. They are found in the intertropical parts of both Old and New Worlds, and some are natives also of temperate climes. The fruit contains a quantity of viscid matter, like bird-lime, by means of which the seeds adhere to trees. The mistletoe belongs to this family. See VISCUM. The genus *Loranthus* is the type, however, and gives it its name. About 250 species are described, all of which are shrubs with branched dichotomous stems, and are all found in hot countries, with the exception of one, *L. Europæus*, which, as its name imports, is found in various parts of Europe. Most of them are parasitic, and few are of any value. The seeds contain tannin; and one species, *L. tetrandrus*, is used in Chili for dyeing black.

Loranthus (λωρον, a thong; ἀνθος, a flower). See LORANTHACEÆ.

Lorinæ and **Lorius.**—A sub-family and genus of parrots. See PSITTACIDÆ.

Loris.—A genus of lemurs. See LEMURIDÆ.

Lota.—A genus of fishes containing the *Ling*. See GADIDÆ.

Lotus.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and containing about fifty species, some of which are well known. *L. corniculatus*, common bird's foot trefoil, is one of our most common plants, occurring in pastures and on dry banks. It furnishes an excellent article of food for cattle. *L. edulis* is a native of the south of Europe and of Egypt, and furnishes a legume which is tender, of a sweet taste, resembling that of peas. In some countries they are used as an article of food, and the whole plant is recommended as a good forage for cattle. The Egyptian lotus is a species of NYMPHÆA; and the lotus of the ancients, which furnished the delicious fruit upon which the people called the *Lotophagi* fed, is a species of ZIZYPHUS.

Loxia. *The Cross-Bill.*—A genus of birds belonging to the conirostral tribe of the order *Passeres*, and family *Fringillidæ*. They are distinguished from the other birds of the family by having the mandibles much compressed, strongly curved, and their points crossing each other. Only two or three species are known, and they are found in the northern parts of Europe and America. The best known species is the common cross-bill, *L. curvirostra*, which is about six inches long, and is found inhabiting Germany, Poland, Sweden, &c., in Europe, about Philadelphia in America, and in Japan. Sometimes they come to this country in great flocks, and are observed to commit great ravages in our orchards. They feed chiefly upon the seeds of fir cones, but are also fond of the pips or seeds of the apple; and it is in their efforts to get at these that they destroy the fruit, as they split the apples in halves in order to reach them. The bill is admirably adapted for this purpose, and they can with equal facility split an almond, shell small seeds, or open and tear up fir cones. In captivity they are enabled, by the same organ, to twist out the ends of the wires of their cages, and they can draw nails out expeditiously. In Thuringia, where these birds abound, the peasants have a strange superstition concerning them. When confined in cages for some time, they are liable to weak eyes and ulcerated feet, &c., and the Thuringian then believes that these poor birds can take upon themselves any disease to which he himself is subject. He believes that a bird whose upper mandible bends to the right has the power of transferring colds and rheumatisms from a man to itself; and if the mandible turn to the left, the bird can render the same service to a woman. As the cross-bills are also frequently attacked with epilepsy in a state of confinement, the peasant drinks every day the water left by the bird, as a specific against that disease. The flesh of the cross-bill is well flavoured, and numbers are brought to market in Vienna.

Loxodonta (λοξος, oblique; ὀδους, a tooth). *The African Elephant.*—See ELEPHANTIDÆ.

Lucanidæ. *The Stag-Beetle family.*—A family of pentamerous *Coleoptera*, containing a number of genera, of which the type is *Lucanus*. The beetles belonging to this genus are often of considerable size, and receive the name of stag-beetles from the very large and powerful mandibles with which the males are furnished. The common stag-beetle of this country, *Lucanus cervus*, has them of very considerable size, and they prove formidable instruments of offence. They live during the day in the trunks of trees, and fly abroad during the night, often entering houses, to the no small alarm of their inhabitants. The larvæ are large, fleshy grubs, which live in the trunks and roots of trees, boring into their substance, and causing considerable injury. They are said to be six years in coming to their growth. Some of the exotic genera are remarkable for their splendid metallic colouring, as the *Chiasognathus* and *Lamprina*.

Lucernaria.—A genus of helianthoid or zoanthoid *Anthozoa*, characterized by having the tentacles arranged in little tufts. Three species are found on the British coasts: and when in a

state of expansion, few marine worms exceed them in beauty and singularity of form; when contracted, they are shapeless and easily overlooked. They feed on small crustaceous animals, brought within reach by the tide, and to arrest them more certainly, the tentacula are widely displayed; but no sooner have they felt their prey, than they instantly contract, envelop it in their joint embrace, and carry it to their mouth.

Lucilia.—The blue bottle fly. See MUSCIDÆ.

Lucina.—A genus of bivalve *Mollusca*, comprising a good many species of shells which have the general character of being sub-orbicular, sub-equilateral, more or less convex, generally white, or slightly coloured. They are found in the seas of all climates, the largest being natives of warm latitudes. About seventy recent species are enumerated, though several of these have been lately arranged in three or four sub-genera, and no less than 200 fossil species have been found, occurring in the upper silurian.

Lucuma.—A genus of dicotyledonous plants belonging to the nat. ord. *Sapotaceæ*, comprising several species, which are trees yielding a milky juice and an edible fruit. They are natives of South America and the West Indies; and one of the species, *L.* (*Achras*) *mammosa*, is known by the name of the mammee sapota. It reaches a height of from fifty to one hundred feet, and is cultivated in some of the West Indian islands for its fruit, which possesses a soft pulp, of a luscious flavour, resembling marmalade—hence it is often called *natural marmalade*.

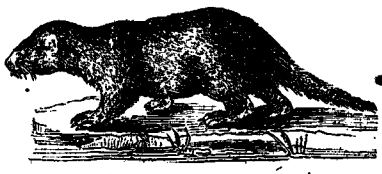
Lumbricus.—The earth worm. See ANNELIDA.

Lupinus. *The Lupine.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Papilionaceæ*, comprising many species of herbaceous and slightly shrubby plants, growing in the temperate and sub-tropical parts of nearly the whole surface of the globe, but more especially in North America. Many of the species are cultivated as ornamental plants in our gardens, and some of them are useful as articles of food for cattle. *L. albus*, the white lupine, is one of the most important of these, and is extensively cultivated in the south of Europe, and more especially in Italy. When young, it affords good pasture for sheep; and the seeds, when macerated for a short time, to destroy their bitter taste, are used as food for oxen. The most important use in France of this plant is as a sort of manure for poor lands; it is ploughed in to ameliorate the soil. At one time lupines were much esteemed by the ancients; and even now in Egypt the seeds of *L. ternis*, or Egyptian white lupine, are used by the natives as an article of food, though, as it is difficult to rid them entirely of their bitter taste, they are little used by Europeans.

Luscinidæ.—An extensive family of birds belonging to the dentirostral tribe of the order *Passeres*, and containing many species which have been arranged in several sub-families. The sub-family *Luscininæ* may be considered the typical group. It contains a good many genera, amongst which is the genus *Luscinia*, which gives its name to the whole family. This genus comprises several species, the most deserving of notice of which is the far-famed nightingale, *Luscinia Philomela* (*Motacilla Luscinia*, Linn.) "The very name of this bird calls up the remembrance of such a host of eulogists, that an expressive silence would perhaps be the best tribute to the powers of the nightingale; and tame, indeed, is that Saxon appellation to its Greek name, which would seem to imply that it is the very soul of song. It has been the theme for poetry in all ages, from the earliest lyre to the exquisitely tuned harp that has immortalized the 'bower of roses by Bendemere's stream.' Milton, all ear, has introduced it in his finest scenes, and it sings the nuptial song of our first parents in one of his most beautiful passages. Nor has the eloquence of prose been less warm in its praise. Only turn to the elegant fervour with which Pliny dwells on its miraculous power and execution; or to the honest, pious, English admiration of Izaak Walton, not to advert to a crowd of others; and what more can be said?" The nightingale is about six inches long, the upper parts of its body of a rusty-brown colour, and the under parts pale ash. It is a bird of passage, ariving in England somewhere about the middle of April; and though common in the southern counties, is never seen farther north than Yorkshire, or west, than the eastern borders of Devonshire. It is not found in Scotland nor Wales, in the Channel Isles or Brittany; but is common in Russia, Siberia, Sweden, France, and more especially in Spain and Italy. It is also met with in North Africa, Egypt, Syria, Smyrna, and the Grecian Archipelago; but does not appear to winter in any of these places. It is, however, seen at all times in India, Persia, China, and Japan, and is even more esteemed there than here. Nightingales are solitary in their habits, never associating in flocks. They build their nest on the ground, and loosely construct it of dead leaves and rushes. Their food consists principally of insects, small worms, eggs of ants, and sometimes berries of various kinds. The note of the nightingale is remarkably sweet and pleasing, and all the more so because it is only heard in the stillness of the night. It is also very powerful, and may be clearly distinguished at more than half a mile off.

Lutra. *The Otter.*—A genus of animals belonging to the class *Mammalia*, order *Ferœ*, family *Felidæ*, and sub-family *Mustelina*. The species are characterized by having a large, flat head, a thick body, with short legs, webbed feet, a flat tail, and a peculiar physiognomy, that will not allow them to be confounded with any other genus. They are essentially aquatic animals,

can walk only with difficulty upon land, but swim remarkably well. They live upon fish and other aquatic animals, and are for the most part wild and untractable, though occasionally they have been tamed and taught to fish for their master. They construct a bed of rushes, or such materials, under hollow banks, near the water's edge, where they produce their young. The fur of the otters is much sought after, and consequently the chase of these animals is often followed with great eagerness. One species, *L. vulgaris*, or common otter, is a native of Great



Lutra vulgaris—The Otter.

Britain and many other parts of Europe. It is about two feet long from the nose to the insertion of the tail, which is fifteen inches more. It lives on the borders of lakes and rivers, passing the day in its snug retreat amongst the rocks, and only sallies forth at night to seek its food. Its skin is used by furriers; and in Catholic countries the flesh is eaten in Lent. Otter hunting used to

Enhydra (Lutra) marina—Sea Otter.

be followed in this country, and in some parts still is, with great ardour, and forms a most exciting hunt. The sea otter, whose fur is so much valued in China and Japan, and the sale of which forms a very considerable article of commerce with the English and Russians, in the settlements in North America, and the Hudson's Bay Company's territories, has been transferred to the genus ENHYDRA. A figure of it, omitted there, is here introduced. The otter of the Cape of Good Hope is larger than the otter of Europe; but its habits are much the same, and its fur is similar in texture and in colour. It now forms part of the genus *Aonyx*, *A. Delalandi*. The American or Canada otter, now forming a distinct genus also, *Lataxina mollis*, resembles the European otter, but is much larger, being about five feet long, and its fur is of a glossy brown, is very dense and fine, and is much esteemed. This animal has a peculiar habit—climbing to the top of a ridge of snow in winter, or a sloping moist bank in summer, it lies down on its belly, with the fore legs bent backwards, and gives itself an impulse with its hind legs, so as to enable it to glide swiftly down the eminence. About 7,000 or 8,000 skins of this species are annually imported into England. It abounds in the Mackenzie River and others, and extends as far as the Arctic Sea. South America has its otter also, known by the name of the lontra, *Lontra Brasiliensis*, and sometimes called by the colonists the lobo de rio, or river wolf. It is about three and a-half feet long, and has short and close fur, of a bright ruddy-yellow. These animals live in troops, which, sometimes rising to the surface of the water, lift their heads and bark like dogs with a hoarse voice, in a menacing and snapping manner.

Lutraria (*lutra*, the otter).—A genus of bivalve *Mollusca* belonging to the family *Mactridæ*, and comprising several species of shells of an elongate form, and gaping at both extremities. The internal ligament is contained in a spoon-shaped and very prominent plate. The *otter shells*, as they are sometimes called, are littoral, burying themselves vertically in the mud, leaving only the tips of their syphons projecting. They are chiefly natives of temperate climates, and about eighteen recent and ten fossil species have been described.

Lycæna.—A genus of diurnal lepidopterous insects, forming the type of the family *Lycænidæ*, and containing a number of very pretty species, commonly called *Coppers*.

Lychnis (λυχνος, a lamp).—A genus of dicotyledonous plants belonging to the nat. ord. *Caryophillaceæ*, and consisting of about thirty species of herbs with smooth, hairy, or woolly stems and leaves, and terminal corymbs of flowers. Some of them are handsome, showy plants, and are cultivated as ornaments in our gardens. The scarlet lychnis, *L. chalcedonica*, is the greatest favourite with floriculturists, and

is often called the Cross of Jerusalem or Cross of Malta. It is a native of the southern parts of Russia. Several species are natives of Great Britain, as the ragged robin, *L. flos-cuculi*, the red and white campion, *L. vespertina* and *diurna*, the corn cockle, *L. githago*, a noxious weed amongst corn, and *L. viscaria*, remarkable for the stems being viscous under the joints.

Lycoperdon.—A genus of acotyledonous plants belonging to the nat. ord. *Fungi*, and containing a number of species which are remarkable for the great quantity of dust-like seeds or spores when ripe, which by a little pressure can be thrown to a considerable distance—hence called *Puff Balls*.

Lycopersicum. *The Tomato.*—See SOLANACEÆ.

Lycopodiaceæ (λυκος, a wolf; πους, a foot). *The Club Moss family.*—A nat. ord. of acotyledonous plants belonging to the sub-class ACROGENÆ.

Lycopodium.—The typical genus of the nat. ord. LYCOPODIACEÆ.

Lycosus.—A genus of spiders. See ARANEIDÆ.

Lygidæ.—A family of *Crustacea*. See ISOPODA.

Lygodium.—A genus of acotyledonous plants belonging to the nat. ord. *Filices*, and consisting of beautiful climbing ferns, with conjugate, palmate, lobed, or pinnate leaves, having the sessile seeds in double rows on the teeth of the pinnules. It forms a character in the vegetation in many parts of China.

Lymexylon.—A genus of insects belonging to the serricorn group of the order *Coleoptera*, and nearly allied to the *Elateridæ* and *Buprestidæ*. The larvæ burrow in timber, chiefly oak, and one species, *L. navale*, or ship-timber beetle, is very common in the oak forests of the north of Europe. At one time it multiplied to such an extent in the dockyards of Toulon, that the injuries committed in the wood-works were very serious.

Lymnæa (λιμναιος, marshy). *The Pond Snail.*—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of the family *Lymneidæ*. This genus contains many species which inhabit fresh water, and which are found scattered over most parts of the globe. Notwithstanding their living in water, they respire atmospheric air, and are not able to remain any great length of time under the surface. These animals frequently walk on the surface of the water in a reversed position; and as the movements of the animal in that attitude are very slow, it is difficult to account for the method in which this act of creeping is performed on such a yielding substance as water. About fifty species are described as recent, and seventy are found fossil in the wealden formation.

Lynchus. *The Lynx.*—A genus of carnivorous animals. See FELINA.

Lysimachia (λυω, to appease; μαχη, battle).—A genus of dicotyledonous plants belonging to the nat. ord. *Primulaceæ*, and containing three or four species of herbs, which are found native in various parts of England, but which possess little interest.

Lythrum (λυθρον, black blood; from the purple colour of the flowers.) *Loose-strife.*—A genus of dicotyledonous plants belonging to the nat. ord. *Lythraceæ*. It contains several species, one of which, *L. Salicaria*, or purple loose-strife, is a native of England, several parts of Europe, and of Australia. It contains a quantity of tannin, and has in consequence been used in cases of diarrhœa. *L. Hunteri*, a native of India, has flowers of a beautiful red colour, which have been used for dyeing by the natives.

M

Macacus. *The Bonnet Apes* or *Ape Baboons.*—A genus of monkeys belonging to the family *Simiidæ*. See CERCOPITHECINA.

Machairodus.—A genus of fossil animals. See FELIDÆ.

Machetes. *The Ruff.*—A synonym of PHILOMACHUS. See SCOLOPACIDÆ.

Maclura.—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ* and sub-order *Moreæ*. The dyewood called fustic is the produce of one species, *M. tinctoria*, a large and handsome tree, growing in most parts of South America, in the United States, and the West Indian Islands. The wood of this tree is largely imported to Great Britain, and is extensively used as an ingredient in dyeing yellow. The consumption amounts to about 6,000 tons a-year. In commercial language this is called *old fustic*, to distinguish it from the wood of a species of sumac (*Rhus cotinus*), from Italy and the south of France, which is called *young fustic*.

Macrauchenia.—A genus of fossil animals allied to the llamas. See LAMA.

Macrobiotus (μακρος, long; βιος, life).—A genus of microscopic animals, synonymous with TARDIGRADA.

Macrochisma.—A genus of shells. See FISSURELLIDÆ.

Macrocystis.—A genus of sea-weeds. See THALLOGENÆ.

Macrodipteryx.—A genus of birds. See CAPRIMULGIDÆ.

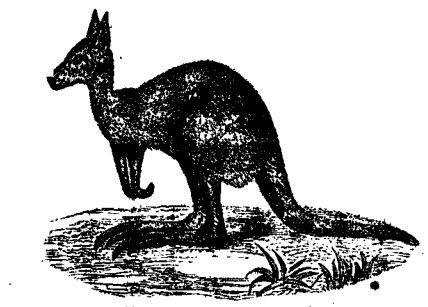
Macroglossa (μακρος, long; γλωσσα, tongue).—A genus of animals belonging to the order *Primates*, family *Vespertilionidæ*, and sub-family *Pteropina*. This genus of bats is distinguished from the other genera by the length of their muzzle and their long cylindrical tongue. Only

one species is as yet known, a native of Java.

Macronyx (*μακρος*, long; *ονυξ*, claw).—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, family *Luscinidæ*, and subfamily *Motacillinæ*. The genus contains only one species, remarkable for the length of the claw of one of its toes. This bird, *M.* (*Alauda*) *Capensis*, is a native of South Africa, in the neighbourhood of the Cape of Good Hope, and has received the name, from a French naturalist, of the *Sentinel*, because its cry, especially when a human being or any animal passes near its nest, resembles exactly the words "qui vive? qui vive?" It is eaten by the colonists under the name of the little turkey, and is reckoned by them good game.

Macropidæ (*μακρος*, large; *πους*, foot). *The family of Kangaroos.*—An extensive family of animals, distinguished from all others by the females having no *placenta*, and by their young being nursed in a peculiar pouch on the belly of the mother, called the marsupial pouch, supported by two peculiar bones attached to the pubis. See MARSUPIALIA. The animals belonging to this family are varied in appearance and habits. Some live on vegetables, and others are carnivorous, and of these some feed on flesh and others on insects. They are arranged in several distinct subfamilies, according to their structure and habits. They are, with few exceptions (DIDELPHYS), confined to Australia, and are all characterized by a very low degree of intelligence. The phalangers, PHALANGISTINA, have the second and third toes so completely included within the skin as to appear a single toe, were it not for the distinct claws which project, although placed close to each other. They are covered with a close, soft, and thick fur. They live on trees or bushes, and have a strong prehensile tail, with which they hook themselves to the branches upon which they doze throughout the day. They are not very active, and may be generally seen suspended to or squatting upon the larger boughs with their tail curled round them. They have a very strong smell, but notwithstanding this their flesh is eaten. The genus *Phalangista* contains several species, characterized by having the tail cylindrical and hairy, and the ears long and straight. Of these the vulpine phalanger, or New Holland bear, *P. vulpina*, is, perhaps, the most common. It is described as being like the fox in shape, but considerably smaller, being only twenty-six inches in length from the tip of the nose to the root of the tail, this member being fifteen inches long. It is said to be omnivorous, living on young birds, vegetables, and fruit. In captivity they sit upright like squirrels, and feed themselves with their fore paws. In the genus *Cuscus*, the tail is long, scaly, and rat-like, and the ears are short. There are several species of this genus, natives of the islands of the Indian archipelago. The genus *Petaurus* has the skin of the body expanded between the anterior and posterior limbs, which enables the species to jump from tree to tree. The tail is bushy and broad, and scarcely prehensile. Four or five species are known amongst which the most familiar is the Norfolk Island flying squirrel, or sugar squirrel, as it is sometimes called, *Petaurus sciureus*. This pretty little animal is a native of New South Wales and not of Norfolk Island, as its English name imports, and appears to be a nocturnal species. During the day it remains quietly nestled in the hollows of trees, but becomes animated as night advances, and skims through the air, supported by its expanded skin, half leaping, half flying, from branch to branch, feeding upon leaves and insects. The genus *Phascolarctos*, or koala, has somewhat the appearance of the *Phalangista*, but has no tail. The species are heavier looking animals, and they carry their young on the back of their neck. The cinereous koala, *Phascolarctos cinereus*, is between two and three feet in length, and its general form resembles that of a bear. The ears are short, wide, and erect; the eyes lively, always in motion, sometimes fiery and threatening. It is generally seen sitting like a dog, and is found in the forests about fifty or sixty miles to the south-west of Port Jackson. It climbs well, and lives on the tops of the little blue gum trees, where it rests during the day, either sleeping or feeding on their tender shoots, which it prefers to any other food; in the night it descends and prowls about, scratching up the earth in search of some particular roots. The natives eat its flesh, and climb the gum trees with great dexterity in pursuit of it. The *Macropina*, or kangaroos, have the tarsus and middle toe of the hind feet elongated, and the two inner ones rudimentary, equal, and united together. With one exception they live on the ground. Their tails are conical and tapering, and covered with rigid hair. The genus *Macropus*, or kangaroo proper, has very large hinder limbs, and the tail is of remarkable length and strength. This organ is of great importance to the animal; as it serves not only as a third resting point when the animal is at rest upon its haunches, but answers the purpose of an offensive weapon, and an organ of locomotion. It assists in the astonishing leaps which the kangaroos continually take in moving about; their progression, in fact, consisting of a series of springs, frequently of twenty feet at a time, instead of walking on all four extremities, a position which they only assume when feeding. They are harmless and inoffensive creatures. The great kangaroo, *Macropus major*, is the largest species, measuring five or six feet from the tip of the nose to the root of the tail, and when sitting appears about the height of a man. To the aborigines of Australia, the kangaroo forms an important article of food; and this, and some other species, are much sought after on the same account by Europeans. Soup made of the tail of the kangaroo is said to be far superior to the ox-tail soup

of Europe. The great kangaroo inhabits New South Wales, Southern and Western Australia, and Van Diemen's Land. Individuals have been brought alive to this country, and have been successfully kept in some of our parks. The



Macropus major—Great Kangaroo.

genus *Lagorchestes* contains several species, known from their resemblance to their European namesakes, by the name of kangaroo hares. They are about the size of the common hare, are very nimble, and their powers of leaping are extraordinary. The genus *Hypsiprymnus* has received the name of kangaroo rat, and the species belonging to it are characterized by having a naked scaly tail like that of their namesakes. *H. minor*, the potoroo, is about the size of a rabbit six months old, and lives on the roots of plants, which it scratches up with its feet. The genus *Phascolomys* contains one species, known by the name of the wombat, or ursine opossum, *Phascolomys ursinus*, which is about the size of a badger, but in general appearance resembles a small bear. It burrows in the ground, remains quiet during the day, but becomes lively at night. It is found in the mountains near Port Jackson, and its flesh is said to be preferable to that of all the other animals of Australia. The tree-kangaroo, *Dendrolegus ursinus*, is the exception mentioned above to the general habit of the *Macropinæ* living on the ground. This animal inhabits New Guinea, and lives on trees. The fore legs are nearly as long and as strong as the hinder, the tail is of great length, and their feet are furnished with long curved pointed claws, which are admirably adapted to assist the animal to climb the trees, amongst the branches of which it chiefly lives and finds its food. The *Peramelina*, or bandicoots, have very much the appearance of small kangaroos, but their tail is short and slender. They burrow in the ground, move by a succession of leaps, and feed upon insects. The spiny bandicoot, *Peramela obesula*, is about the size of the common rat. An animal resembling a species of this genus was discovered some years ago on the Murray River, but is characterized by having the fore legs resembling those of a pig. It was called by the party who captured it the pig-footed bandicoot, and has received the generic appellation of *Chœropus*. It has a very long and slender snout, and is destitute of a tail. This animal, *Chœropus ecaudatus*, is the only species of the genus, and appears to be very rare. The dasyures, *Dasyurina*, are carnivorous animals and live upon carrion, or animals which they can overpower. See DASYURINÆ. These are like the great majority of this extensive family natives of Australia, but the last group we have to notice are natives of America or the West Indies. These are the opossums, but for their characters see DIDELPHIDÆ. Numerous remains of fossil extinct marsupial animals have been found in various parts of the world. Many of these can be referred to recent genera, as *Macropus*, *Didelphys*, *Dasyurus*, *Hypsiprimnus*, &c., but in addition to these, remains have been found in England in the slates of Stonesfield. These have been referred to two new genera, which have been named *Thylacotherium*, and *Phascolotherium*.

Macropiper (*μακρος*, large; *piper*, pepper)—A genus of dicotyledonous plants belonging to the nat. ord. *Piperaceæ*. The root of one species called kava, *M. Methysticum*, a native of the South Sea Islands, is strongly narcotic, and an infusion of it in water is used by the natives in cases of chronic rheumatism. It is an intoxicating beverage, and they make themselves drunk with it, after which a very copious perspiration comes on, which lasts two or three days, at the end of which time the patient is cured.

Macropodidæ (*μακρος*, large; *πους*, foot).—A tribe of brachyurous decapodous *Crustacea* belonging to the family *Oxyrhynchi*, and remarkable for the enormous length of their feet, which has obtained for them the name of spider crabs, or sea spiders. The species are for the most part deep water crabs, lying hid among sea-weeds or in oyster banks. The genus INACHUS of Leach may be taken as the type, and formerly contained nearly all the species belonging to the tribe.

Macropus (*μακρος*, large; *πους*, a foot).—The kangaroo genus. See MACROPIDÆ.

Macrorhinus (*μακρος*, large; *ρις*, *ρινος*, nose) *The Elephant Seal*.—See PHOCIDÆ.

Macroscelides (*μακρος*, large; *σκελος* thigh). *Elephant Shrews*.—A genus of animal belonging to the class *Mammalia*, order *Feræ* family *Talpidæ*, and sub-family *Erinaceina*. This genus contains several species, all of which are natives of South Africa, except one, which is found in Barbary. *M. proboscideus*, the typical elephant shrew, was known to some of our earlier naturalists, though indistinctly described. It is now ascertained to be a native of the Cape of Good Hope, measuring in extreme length about a foot, and having much the same coloured fur as the common hare. It has a long nose like a trunk, long hind legs, and the habits of the jerboa. *M. Roretti*, the Algerine elephant shrew, is a native of North Africa, and resembles the last

but is somewhat larger. Its manners are very mild and gentle, and it is easily tamed. Its favourite food is insects.

Macroura (*μακρος*, large; *ουρα*, a tail). *Long-tailed Crustacea.*—A section of crustaceous animals belonging to the tribe *Decapoda*, and easily recognized by their long tail and large caudal fin. The carapace is almost always longer than broad. The antennæ are very long. The thoracic feet are generally long and slender, and the first pair in most cases transformed into hands or prehensile organs. The abdomen is terminated by two large plates shaped like a fan and forming a fin, by means of which they swim with considerable velocity. They are indeed essentially constituted for swimming, and not for walking, and none of them appear to leave the water with the exception of the scorpion lobsters of India, *Thalassina*, which live a part of their lives on land, and destroy the new made roads by the excavations they make under them. Some burrow in the sand or mud a little distance from the shore, and make long winding horizontal passages, often of a hundred feet or more in length, as the mud borers, *Calianassa* and *Gebia*. Many are large and valuable as articles of food, as the lobster. See HOMARUS. The spiny lobsters, *Palinurus*, have no claw or pincer to the first pair of thoracic feet, and their carapace is covered with numerous spines. The common species, *P. vulgaris*, grows to the length of eighteen inches, and is said sometimes to weigh twelve or fourteen lbs. They are often brought to the London market, and are considered to be very delicate eating. Most of the species belonging to this section are marine, but some, as the cray-fish, *Astacus*, live in fresh water streams, and the *A. fluviatilis*, which is the only European species, and is from three to four inches in length, is often brought to market, though not highly esteemed as an article of food. A numerous family belonging to this section, are small, and have rather a soft carapace. Many of them are edible, and some form an important object of fishery to the people on our coasts, such as the shrimp (see CRANGON) and the prawn (see PALÆMON).

Mactra (*mactra*, a kneading trough).—A genus of bivalve shells forming the type of the family *Mactridæ*. The species are natives of all parts of the world, and live buried in the sand of the sea shore at a little distance from the edge. The shells are generally of a trigonal shape, nearly equilateral, and of a brownish, yellow, or white colour. They appear to be the favourite food of echini and whelks; and in the Isle of Arran, one of the species, *M. subtruncata*, is collected at low water to feed pigs. About sixty species are found recent, and thirty have been described as fossil from the lias.

Madia.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and suborder *Corymbiferæ*. Only two species are known, one of which, *M. sativa*, a native of Chili, is cultivated for the sake of its bland oil, which is obtained from it in large quantity and of excellent quality, either by expression or simple boiling. It is valuable for keeping machines in order, and in taste is almost equal to olive oil.

Madreporidæ. *The Stony Corals*, or *Madrepores.*—See ANTHOZOA.

Magilus.—A genus of gasteropodous *Mollusca* belonging to the family *Buccinidæ*, and containing only one species, *M. antiquus*, which lives in the substance of masses of coral. The young shell has been described as a distinct genus under the name of *Leptoconchus*. It is an oval, heliciform, thin shell, composed of four whirls, the last of which is the largest, and terminates in a tube directed in nearly a straight line. As it is necessary for the animal to have its aperture on a level with the surrounding surface, or near it, it is obliged to continue this tube as long as the coral keeps growing. As it goes on increasing, the animal abandons the spiral shell, and takes up its abode in the tube, secreting, at the same time, a compact calcareous matter which reaches to the very summit of the spire, so that, in an old specimen, the posterior part of the shell presents a solid and almost crystalline mass. This tubular shell has been taken for a stalactite or mineral concretion, and by Lamarck was first considered to be the tube of an annelide.

Magnesia.—A mineral substance found in nature, and consisting of several varieties or species. Pure crystallized native magnesia, or *Periclase*, is found disseminated in the crystalline rocks of mount Somma, at Vesuvius. *Brucite*, or hydrate of magnesia, is found in small veins in serpentine rocks in North America, and in Unst, in Scotland. *Magnesite*, or hydrous tersilicate of magnesia, is found in a compact calcareous rock in Anatolia, in Spain, in France, &c. It is of the consistency of wax when first dug, has a greasy feel, and is remarkable for its extreme lightness. This is the substance which is called "scum of the sea," and by the Germans "meerschaum," and which is so much used in the manufacture of the Turkish pipes, so highly prized at Constantinople. It is used also by the Turks and Tartars for washing their linen.

Magnesite.—A variety of magnesia. See above.

Magnolia.—See MAGNOLIACEÆ.

Magnoliaceæ.—A nat. ord. of dicotyledonous plants, containing numerous species which are trees or shrubs, and many of them remarkable for their elegance and beauty. The whole plant, but especially the bark and the fruit, abound in an aromatic bitter principle. Their leaves are coriaceous, generally quite entire, and often marked with lucid spots. The flowers are often very large, and highly odoriferous. They abound in the warmer parts of North America, forming a characteristic trait in the vegetation of the country. They occur also in Australia, New Zealand, and Japan. Several species afford useful substances. The

kind of bark called winter's bark, which is used medicinally as an aromatic stimulant, is derived from a species of the genus *Drimys*; and the substance called "star anise," which is employed as a carminative, is the fruit of a species of *Illicium*. The genus *Magnolia*, however, is the type, and gives its name to the family. The magnolias are trees, remarkable for the beauty of their foliage and flowers, and as they are natives of temperate climes, they stand this climate remarkably well, and are accordingly highly prized as ornaments for our parks and shrubberies. *M. grandiflora* is a magnificent species, majestic in habit, beautiful with its fine large leaves, and abundant in splendid flowers. In its native climate it attains a height of from 70 to 100 feet, with a stem more than a yard in diameter. The leaves are coriaceous and shining underneath; the flowers are pure white, and possess a strong and agreeable odour. It is a native of the banks of the Mississippi; and from the resemblance of the leaves to those of the laurel, it is called by the residents the big laurel. The first specimen of this fine tree introduced into Europe was brought to France in 1732. The glaucous magnolia, *M. glauca*, however, was introduced into England as early as 1688, and had been distributed over Europe before the preceding species was known. It is a native of New York, is smaller than the other, and its root is used in dyeing. It is also considered a sudorific, and the fruits, infused in brandy, impart to it a bitter taste, which has caused it to be employed in intermittent fevers. *M. acuminata* is known in America by the name of cucumber tree. It is a fine species, growing abundantly in the Alleghanies. The wood of the tree is susceptible of a fine polish, and is used by the Americans in cabinet-making, and by the Indians for hollowing out into canoes. *M. yulan* or *conspicua* is a native of China, where it is considered one of their most beautiful ornamental plants. It grows to a height of from forty to fifty feet; and its flowers are white and so numerous, that the tree appears covered with them. This is one of the first plants introduced into this country by Sir Joseph Banks, and is also one of those plants which the Chinese like so much to dwarf. These dwarf plants fetch a very high price, and are so much esteemed that they are kept to adorn the Emperor's palace. The seeds are employed by the Chinese in stomach complaints, diseases of the chest, and rheumatism.

Maia.—A genus of decapodous *Crustacea* belonging to the order *Brachyura*, and family *Oxyrhyncha*. The species of this genus, which are generally designated in this country by the name of spider crabs, have the carapace ovate, sub-triangular, convex, and covered with spines or tubercles. It is much narrowed in front, and the rostrum or beak is strong, and divided into two sharp-pointed horns. The genus, when first established, contained many species—indeed all the family almost were comprehended under this one head. As now restricted, however, by recent authors, it contains but few species. Of these the spider crab or corwich, *M. squinado*, is the best known. It is generally about four or five inches long, though sometimes more. It occurs abundantly in England and Ireland, and is eaten by the poorer classes, though considered very inferior to the great crab, *Cancer Pagurus*. These crabs make their appearance on our coasts about the month of May, and from that time till the end of the fishery, in August or September, they occur in great numbers, and vex the fishermen. As soon as they enter the fishing pots they are continually in motion, scrambling from one part to another, and by their restless activity frighten the larger crabs and lobsters, and prevent their entering. They shed their spawn about August or September, and the young, when first hatched, are very unlike their parent, undergoing a series of changes before they arrive at the perfect form. An ordinary-sized "corwich" will bear at one time upwards of 76,000 eggs.

Majorana.—The plant well known as the sweet marjorum (*Origanum Majorana*) has of late been raised to the rank of a genus, under this name. See ORIGANUM.

Malachite.—A mineral. See COPPER.

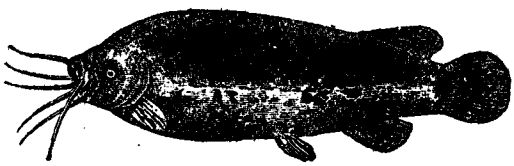
Malacologia. *Malacology* (μαλακος, soft; λογος, a discourse).—A name given by some naturalists to designate the study of the *Mollusca*. See MOLLUSCA.

Malacopterygii (μαλακος, soft; πτερυξ, a wing).—An order of fishes containing those species which are characterized by having the rays of the fins flexible, soft, and cartilaginous, and the bony pieces articulated by cartilage. In this order are contained the abdominal fishes, as the CYPRÍNIDÆ, ESOCIDÆ, SALMONIDÆ, CLUPEIDÆ, &c.; the sub-brachial fishes, as the GADIDÆ, PLEURONECTIDÆ, DISCOBOLI, &c.; and the apodal fishes, as the MURÆNIDÆ, GYMNOTIDÆ, &c.

Malacostraca (μαλακος, soft; οστρακον, a shell).—A name applied by Aristotle to the crustacea in general, but used by Latreille and succeeding naturalists to designate only a particular division of the class. It contains the greater part of the large crustacea, especially those which are useful to man, and is divided into two great groups or legions, the PODOPTHALMA, and the EDRIOPTHALMA.

Malapterurus (μαλακος, soft; πτερον, a wing; ουρα, tail).—A genus of malacopterygious fishes belonging to the section *Abdominales*, and family *Siluridæ*. The species are distinguished by having no dorsal fin, and only one small adipose fin on the tail, and are possessed of electrical powers. *M. electricus*, a native of the Nile, has long been known. Another species, *M. Beninensis*, has lately been discovered at Old Calabar, West Africa, living in the muddy creeks

there. This species is from four inches in length to the size of a herring, and possesses the electrical power in a high degree. A specimen, only two inches long, was found to give a man a shock which reached to his shoulder; and some other



M. electricus.

fishes (species of *Lophius*), placed beside it in a vessel of water, were soon stunned. This electrical property is made use of by the natives as a remedy for their sick children. The fish is put into a vessel of water, and the child made to play with it, or the child is put into a tub of water in which several fish are placed. A tame heron had a newly caught electric fish given to it, which it swallowed. It immediately uttered a loud cry, and was thrown backwards. It soon recovered, but never afterwards could be induced to dine upon a *Malapterurus*.

Malleus. *The Hammer Oyster.*—A genus of bivalve shells. See AVICULIDÆ.

Malpighia (after the celebrated naturalist Malpighi).—A genus of plants. See MALPIGHIACEÆ.

Malpighiaceæ.—A nat. ord. of dicotyledonous plants, consisting of trees or shrubs, sometimes climbing, with opposite, simple, generally entire leaves, and usually red or yellow flowers. The genus *Malpighia* is the type of the family, and comprises several species, which are natives of the West Indies and South America. The fruit of *M. glabra* is in form of a drupe, has the appearance, and is about the size of a cherry. It has an agreeable acid taste, is eaten by the West Indians, and is called by them the Barbadoes cherry. The leaves of *M. urens* are furnished on the inferior surface with peltate hairs, which secrete a caustic juice, and which, when applied to the skin, produces a burning sensation like the stinging of nettles. The bark of one or two species is astringent, and has been used in fevers, diarrhœa, and hæmorrhages, &c.; as also for tanning. The genus *Nitraria* has been doubtfully referred to this nat. order; it contains one species, *N. tridentata*, which is found in the desert of Soussa, near Tunis, and is said by some to be the true lotus tree of the ancient *Lotophagi*.

Malurus.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and containing several species, which are abundantly dispersed throughout New South Wales. The superb warbler, or blue wren, as it is called by the colonists, *M. cyaneus*, is the type of the genus, and is a very pretty and interesting species. The male bird, especially in the pairing season, has resplendent plumage and a very animated song.

Malva. *The Mallow.*—See MALVACEÆ.

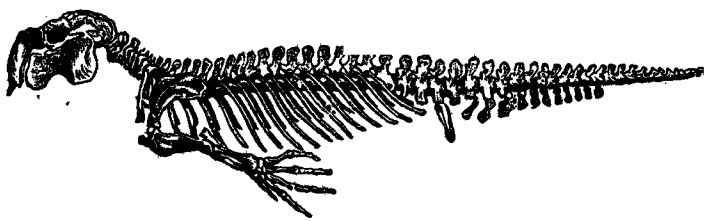
Malvaceæ. *The Mallow family.*—A nat. ord. of dicotyledonous plants, containing many species, which are characterized by having a woody or herbaceous stem, abounding in a watery or mucilaginous juice. This large order is divided into three sub-orders. *Hibiscæ*, containing the genera HIBISCUS, GOSSYPIUM, and others; *Sideæ* containing the genus *Sida*, &c. and *Malveæ*, which is the type and contains the genera *Althæa*, *Lavatera* and *Malva*, &c. The species of this last sub-order are numerous, and abound under the tropics. They are particularly abundant in America, only a few being found in our own climate. They consist of herbs and shrubs scarcely ever rising to the height of trees. See LAVATERA. The different parts of the plant abound in a mucilaginous substance, which possesses an emollient quality, well known to exist in the mallows and in ALTHÆA. The genus *Malva* which represents this sub-order, and imparts its name to the whole family, contains more than 100 species, dispersed over almost the whole globe though they chiefly abound in the Mediterranean and at the Cape of Good Hope. The flowers of the mallows are remarkable for the variety of colours they possess, and their fruit is a depressed capsule, which in this country especially amongst children, are called *cheeses* and in France *fromagions*. Several of the species of *Malva* are cultivated in our gardens as ornamental plants; others are interesting as being useful in medicine. Of these latter, *M. sylvestris* and *rotundifolia* are very common growing in waste, uncultivated places and roadsides in this country. The Romans were wont to eat the leaves of these plants as a substitute for spinach; and at the present day they are employed for a similar purpose in some parts of France, Italy, and Lower Egypt. They are much more useful, however, employed as medicinal agents, as they are very serviceable in the form of decoction in cases of catarrh, dysentery and internal irritations; and in the form of poultices, fomentations, and baths.

Mammalia (*mamma*, a teat).—A class of animals distinguished by their all bearing two or more teats, which secrete milk, by which the young are fed. They are all provided with a vertebral column, and a skin covered with hairs, and they breathe atmospheric air by means of lungs. At the head of this grand class stands pre-eminently, lord over all, man. All quadrupeds belong to this class; and whales and other allied animals form another portion of it.

Mammea.—*The Mammee Tree.* See CLUSIACEÆ.

Manaticora. — A genus of beetles. See CICINDELIDÆ.

Manatidæ.—A family of animals belonging to the class *Mammalia*, and order *Cete*. Their exact position in the systematic arrangement of animals is not yet, however, positively determined, as some naturalists wish to place them with the pachyderms, instead of the cetaceans. They are entirely vegetable feeders, while all the other families of the whale tribe are carnivorous. This family contains three genera—*Manatus*, *Halicore*, and *Rhytina*. The manatees, the sea cow or woman fish of English sailors, *Manatus Australis*, are natives of the seas of the West Indies and South America. They are gregarious, and generally go in troops. They are very fond of their young, so that if the calf be taken, the mother easily falls a sacrifice also to the whalers. If the mother be captured, the young follow her to the shore, and fall an easy prey. They are very inoffensive in their manners, and their flesh is said to be excellent eating. The muzzle of the manatee is thick set with hairs, giving somewhat the appearance of a long beard, or head of human hair. The teats are placed on the chest, and their flippers show, through the skin, the appearance of five fingers, with vestiges of nails on their edges. These organs they use dexterously in creeping along, and carrying their young. This general conformation of body, and adroit use of their flippers, &c., have in all probability had their share in producing the belief of



Halicore Dugong—Skeleton of Dugong.

the marvellous tales about mermen and mermaids. The Indian dugong, *Halicore Dugong*, resembles in general form the manatee, but is a native of the Indian Ocean, living in shallow water on the sea coasts, and subsisting on algæ and fuci. They feed in flocks like sheep, and their flesh is esteemed as excellent eating. The females produce only one young at a time, and their maternal affection is very strong. Another species is found in the Red Sea, and was observed by Ruppell swimming on the coral banks on the Abyssinian coast, near Dulac. This naturalist calls it *Halicore tabernaculi*, from an impression he had that it was with the skin of this animal that the Israelites were directed to veil the temple. *Rhytina gigas* is a native of the Arctic Ocean and Behring's Straits; but there is not much known about its habits. Fossil remains of a species of *Manatus* have been found in the tertiary formations of France.

Manatus. *The Manatee.*—See MANATIDÆ.

Mandragora (*μανδρα*, eatable; *αγυρος*, hurtful). *The Mandrake.*—A genus of plants. See ATROPA.

Manetha.—A genus of dicotyledonous plants belonging to the nat. ord. *Cinchonaceæ*. *M. cordifolia* is a native of Brazil, and is a glabrous, suffruticose plant, with slender, round, twining stems, and a gray bark. The bark of the root is esteemed in Brazil as a most valuable remedy in cases of dropsy and dysentery. It acts as an emetic.

Manganese.—A metal which, when pure, is of a grayish colour, like cast iron, and has a good deal of brilliancy. Its specific gravity is about 8. It is very brittle, and can neither be hammered nor drawn into wire. There are a considerable number of ores of manganese found in many parts of the world, the most numerous of which, and by far the most useful, are oxides. The binoxide, peroxide, or *Pyrolusite*, is the most valuable, economically speaking, and occurs in large quantities in England, Thuringia, Brazil, and many other places. This ore is employed in making oxymuriatic acid for forming bleaching liquor, in glazing black earthenware, giving colours to enamels, and in the manufacture of porcelain. It is also extensively employed in the manufacture of flint glass. It renders the glass transparent and of a fine colour, as it oxidizes the carbon contained in the other materials, which would otherwise have rendered the glass brown. The oxide of manganese is also a very valuable ore for the evolution of oxygen, and is generally used by chemists for obtaining that gas. The hydrated binoxide of manganese is common in Derbyshire, where it is generally known by the name of *Black wad*. It is frequently soft enough to stain the fingers, and is remarkable for its spontaneous igniting with oil.

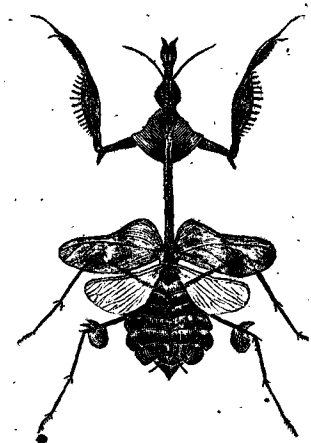
Mangifera. *The Mango Tree.*—See ANACARDIACEÆ.

Manihot.—The plant previously mentioned under the name of *Jatropha Manihot*, has been by some botanists considered a distinct genus,

and described as *Manihot utilissima*. It furnishes cassava and tapioca. See JATROPHA.

Manis.—A genus of animals belonging to the class *Mammalia*, order *Ungulata*, and family *Dasypidæ*. The species are confined to the Old World, and have their bodies covered with imbricate scales. They are entirely destitute of teeth, have a very long extensile tongue, and live chiefly on ants. They have an awkward gait, walking on the outer sides of their feet, with the claws turned in. They are harmless in their nature, but are remarkable for the strength and number of their caudal vertebræ. They are known also by the name of pangolins or scaly ant-eaters. They have the power of rolling themselves up in the form of a ball, and the scales which cover the body are so hard and impenetrable, that they defy the utmost power of the tiger, panther, or hyæna, to hurt them. There are four species described, the most important of which, *M. tetradactyla*, upwards of two feet in length, is a native of Africa, and *M. pentadactyla* is a native of India.

Mantidæ.—A family of insects belonging to the order *Orthoptera*, characterized by their having a very long prothorax, and by their anterior feet being armed with hooks and strong spines. The species have a very peculiar aspect. Their narrow and lengthened body, their elytra marked with numerous nervures, embracing the sides of the body, and their well developed anterior feet, in shape like those of the stomapode crustacea, and formed more for seizing their prey than walking, give them an appearance which readily distinguishes them from the other families of the order to which they belong. They are carnivorous insects, and the structure of their feet is well adapted for that manner of life. Their movements are slow, and they may be seen crawling sluggishly on the branches of trees and shrubs, and often waiting on the same twig for hours for a stray insect to pass near them. When one comes within their reach, they dart forth their long anterior feet, and seize their prey. Their usual attitude when at rest is to sit upon their four hinder legs, holding their head and long prothorax nearly erect, and their strong anterior feet folded backwards. This peculiar attitude has long attracted the notice of observers, and has obtained for them the name of the *praying mantises*. A curious belief at one time prevailed in the south of France, where these insects abound, that if a child who had lost its road should address itself to one of these creatures, and ask its way, it would point it out immediately, by lifting up one of its fore feet and pointing in the proper direction! In some parts of Africa these insects are still regarded by the natives with veneration, and the Hottentots in the neighbourhood of the Cape of Good Hope regard one species found there as a divinity, and consider any person it might alight upon as having received from heaven an especial mark of favour. These insects generally inhabit warm countries, and are found all over Africa, in South America, and the warmer states of North America, in the greater part of India, and in New Holland. Several species are common in the south of Europe, especially in Sicily, Italy, and south of France. In Africa they are often found in the cactuses. They are very voracious; and it is said, when a number are shut up together in a box they devour each other, the males, which are smaller than the females, falling the first victims. The females deposit their eggs, contained in a capsule, upon some plant, to which they attach them. The young, when they are hatched, resemble the adult, with the exception of wings—organs which they do not obtain till such time as they reach the nympha state. The species are generally large, handsome insects, adorned with lively colours and brilliant spots. The species here figured, *Empusa gongylodes*, is a native of India, and will give an idea of the general form of the insects belonging to this family. The genus *Mantis*, which is the type of the family, contains two or three well known European species, of which the common praying mantis, *M. religiosa*, may be taken as the type. It is common in the south of France, and has been found extending as far north as the forest of Fontainebleau.



Empusa gongylodes.

Mantis.—See MANTIDÆ.

Maranta.—A genus of monocotyledonous plants belonging to the nat. ord. *Cannaceæ* or *Marantaceæ*, and composed of herbs which have a well developed rhizome or tuberous root, containing a large quantity of fecula or starch. The species are natives for the most part of tropical America, a few being found also in India. The structure of their flowers is remarkable, and their fruit is fleshy. The most important species

of the genus is *M. arundinacea*, a plant which is extensively cultivated in the West Indies, the southern parts of the United States, and the Isle of France, for the sake of its root, which affords the substance so well known as *arrow-root*. This root consists of a tuber of a peculiar form, and contains a large proportion of fecula. The stem is upwards of three feet high, and the flowers are white, delicate, and small. In Cayenne the tubers are eaten by the natives roasted, as a cure for intermittent fevers, and when bruised, are applied by them to wounds, and considered more especially as a specific against those caused by poisoned arrows—hence the name of arrow-root.

Maratta.—A genus of plants. See DANÆEÆ.

Marginella.—A genus of gasteropodous *Mollusca*, the animals of which are nearly allied to, and form part of, the family *Volutidæ*. It contains numerous species of beautiful, brightly coloured, and highly polished shells, and characterized by their having several pleats on the columella. They inhabit equatorial seas.

Marmor. *Marble.*—The mineral substance generally known by the name of marble is a granular variety of limestone. There are several kinds. Some are entirely of one colour; others are veined. Some are composed of grains like loaf sugar, and are called saccharoid; others are compact, or sublamellar. The most celebrated kind of marble is that which the ancients obtained from the island of Paros, and known by the name of Parian marble. It is of this kind that some of the most celebrated ancient statues are made, such as the Venus de Medicis, &c. The quarries are, however, said to be exhausted, and the Carrara marble has now taken its place as a statuary marble. The quarries where this fine grained and close textured marble is derived, are situated on the eastern coast of the gulf of Genoa. The variety called *Lumachelli* marble, exhibits fine iridescent colours, which are believed to arise from the intermixture in its composition of numerous minute fragments of a species of nautilus. The encrinite marble contains numerous fossil shells and species of encrinites. It takes a fine polish. There are numerous varieties of veined marble.

Marrubium.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing a number of species of herbs which are found in the centre of Europe, the borders of the Mediterranean, and the temperate parts of Asia. The greater part are covered with a cottony down. The best known species is *M. vulgare*, which goes by the name of white horehound. It is common in waste places and road sides, and the whole plant abounds in a strong aromatic and slightly musky odour, rather disagreeable, and a bitter but slightly acrid taste. It contains an essential oil, and has been found useful as a slight stimulant at the end of catarrhs, facilitating expectoration.

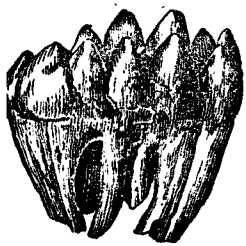
Marsileaceæ. *Pepper Worts.*—An order of plants. See ACROGENÆ.

Marsupialia, or Marsupiata (μαρσυπιον, a pouch).—An order of animals belonging to the class *Mammalia*, and to which the kangaroos and opossums belong. The animals of this order are all characterized by the females being destitute of a placenta, by the young being born in a very rudimentary condition, and being received into a pouch situated on the belly of the mother and supported by two bones called marsupial bones. As soon as the young are expelled from the womb of the mother and received into this pouch, they become attached to one of the teats, and remain in that position for a certain length of time. In some of the genera, as in the *Macropidæ*, or kangaroos, eight months elapse before the young are able to abandon their mother's care and obtain their own nourishment, and for some time after this, whenever they are alarmed, they are enabled to return into this pouch, and are carried by the mother out of danger. In the *Didelphidæ*, or opossums, the period of gestation appears to be about fifteen or seventeen days, and the young, at birth, are very small and feeble. Their mouth is exceedingly small, and excellently adapted for seizing and retaining hold of the nipple. Marsupial animals appear to have been known to Plutarch, as in his treatise on the love of parents towards their children, he describes certain animals which contain their young within them, allow them to go forth to feed, and receive them back again to sleep. From the absence of a placenta in the females, marsupial animals are also called *Aplacentales;* and from the peculiar premature production of their young, *Ovovivipara*. They constitute in fact a distinct sub-class, the members of which are lower in their organization than any other mammiferous animals, approximating in sundry details of their organization to the reptiles. They are divided into two great groups, the *Marsupialia* proper, containing the MACROPIDÆ, or kangaroos, and the DIDELPHIDÆ, or opossums, &c.; and the *Monotremata*, containing the ORNITHORHYNCHUS and ECHIDNA. The food of the marsupial animals consists of every variety, and the species are modified in their structure accordingly. We thus find among them an adaptation of the organs of progression, prehension, and digestion, to their several wants and habits, so that we may trace in them analogies to the carnivorous, insectivorous, herbivorous, and rodent forms of the other mammalia; while in the monotremata we see the analogy to the *Edentata*.

Martes. *The Martens.*—See MUSTELIDÆ.

Mastodon (μαστος, a teat; οδους, a tooth).—A genus of fossil animals belonging to the family *Elephantidæ*, characterized by their molar teeth exhibiting on their crowns large conical points. The remains of these animals are found generally in the pliocene beds of the tertiary

formations, and have been found in all quarters of the globe except Africa. They have long been known, and were considered by the early geologists to be the bones of *giants*, and were appealed to by them as proofs of the existence of the



Tooth of Mastodon.

gigantic human races mentioned in the 6th chapter of Genesis. Several species have been found, but the one which first attracted the attention of naturalists appears to have been *M. giganteus*, the remains of which were brought to this country from North America. They are abundant in all the temperate parts of that vast country, and especially so in what is called the big-bone Lick, in the north part of Kentucky, near the Ohio. In several places where these bones occur they have been found in a vertical position, as if the huge animals had sunk in the soft mud. Remains of a species of this genus have been found also in England on the coast of Suffolk and Norfolk, and is named *M. angustidens*. They have also been found in the Sewalik mountains in India.

Mastodonsaurus. — A genus of extinct saurian reptiles found in the alum slate of Würtemberg. Only some of the teeth have as yet been discovered.

Mathiola.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and containing about thirty species of herbaceous plants, most of which used to be arranged under the genus *Cheiranthus*. Two or three species have been cultivated in our gardens to a great extent, and the sweet scented flowers known by the name of stocks and gilliflowers are the produce. From *M. incana* have been obtained the hoary-leaved varieties, ten weeks' stock, brompton, and queen's; and from *M. glabrata*, the smooth-leaved or green wallflower-leaved stocks.

Matricaria. — A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Corymbiferæ*, and containing several species which are herbaceous, and natives of Europe. The wild chamomile, *M. chamomilla*, is one of the most common species of the genus, and has a slight aromatic smell, and a considerable degree of bitterness, though to a less degree than the real chamomile, *Anthemis nobilis*. It has, however, at times been used instead of it.

Mauritia.—A genus of monocotyledonous plants belonging to the nat. ord. *Palmaceæ*. The miriti, *M. flexuosa*, is a noble and majestic tree, growing to a height of from 80 to 100 feet, and covering large tracts of tide-flooded lands on the upper Amazon. The leaves are fan-shaped and of great size, measuring nine or ten feet in diameter. From the epidermis of the leaves the natives make their hammocks. The thin riband-like pellicle is stripped off from the leaves, tied up in bundles and dried, and afterwards twisted by rolling on the breast or thigh into string, or with the fingers into thicker cords. The hammock made from this string forms the almost universal bed of the native tribes of the Amazon. They sometimes dye the string of many brilliant colours, which they work in symmetrical patterns. From the fruits a favourite Indian beverage is made. They are soaked in water till they begin to ferment, and the scales and pulpy matter to soften, and can be easily rubbed off. When strained through a sieve it is ready for use, and has a slightly acid taste, and a peculiar flavour of the fruit, at first rather disagreeable to European palates.

Meandrina.—A genus of corals. See ANTHOZOA.

Mecistops.—A genus of reptiles. See CROCODILIDÆ.

Medicago. *Medick.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and containing numerous species which are either herbs or shrubs, and natives of Europe. The lucern, *M. sativa*, is one of the most useful plants belonging to the genus. It is found wild in Great Britain, and is very much cultivated as food for cattle in many parts of Europe.

Medusa.—By the general name of *Medusæ* is understood that division of the class *Acalephæ* called *Discophoræ*, or *Pulmogradæ*. The animals belonging to it are entirely gelatinous, consisting of a large hemispherical disc, more or less convex above, very much like a mushroom, or an umbrella; without any solid axis, the margin furnished with long tentacula hanging down from it in the water, and an elongated peduncle suspended from the centre of the inner surface of the umbrella, in which is situated a simple central stomach. They are often called blubber-fishes or jelly fishes. The great genus *Medusa*, of Linnæus, is now made to embrace within it many genera and numerous species. In most of them we see at the base of the marginal tentacula coloured spots, or bulbs with a small cavity within them. These ocelli, or coloured spots, are considered the eyes, or light-perceiving organs, and the small cavities the organs of hearing. In one group these ocelli, or eye-like bodies, are protected by membranous hoods, and the species have a complicated, ramified, and anastomosing system of vessels. Such, for instance, are the true medusæ, one of which, *Aurelia* (*Medusa*) *aurita*, may often be seen, a

hemispherical translucent bluish-gelatinous disc, with fringed margins, floating along in a calm day in many of our harbours, alternately contracting and expanding, and making its way beneath the surface of the water. The disc often measures a foot across, and they sometimes occur in such vast numbers as to impede the course of boats through the water. Another species of this group, and very common on our coasts, is *Cyanæa capillata*, with a wide and nearly flat disc of a pale yellow or tawny colour, scalloped at the margin, and most formidable for its stinging powers. It is the terror of bathers, "and once tangled in its trailing 'hair,' the unfortunate who has recklessly ventured across the graceful monster's path, too soon writhes in prickly torture. Every struggle but binds the poisonous threads more firmly round his body, and then there is no escape; for when the winder of the fatal net finds his course impeded by the terrified human wrestling in his coils, he, seeking no combat with the mightier biped, casts loose his envenomed arms and swims away. The amputated weapons severed from their parent body, vent vengeance on the cause of their destruction, and sting as fiercely as if their original proprietor itself gave the word of attack." For the manner in which these animals are propagated, see ALTERNATION OF GENERATIONS. In another group of these animals the ocelli are naked, often nearly obsolete, and the vascular system consists of simple vessels, either unbranched, or if branched, not anastomosing. Such, for instance, are the *Equoreæ*, several species of which are found on our own coasts. One of these, *Stomobrachium* (*Equorea*) *octocostatum*, is described as of a very elegant shape. "The finest crystal vase is clumsiness itself when compared with it. It is as fine as the transparent soap bubble blown out of a pipe. Delicate as its fabric is, the vigour of the little creature is very remarkable, and has been well compared to the effects of a strong swimmer as it alternately contracts and expands its pellucid organization." Another is *Thaumantias* (*Medusa*) *hæmispherica*, an active little animal, which is gregarious, being found in great abundance in some parts of our coasts, and very luminous at night. It measures about half an inch across the disc.

Megacephala (*μεγας*, large; *κεφαλη*, head).—A genus of beetles. See CICINDELIDÆ.

Megaceros (*μεγας*, large; *κερας*, horn). *The Irish Elk.*—A fossil genus of deer. See CERVINA.

Megachile. *The Leaf-Cutting Bees.*—See APIDÆ.

Megalichthys (*μεγας*, large; *ιχθυς*, a fish).—A genus of fossil ganoid fishes, the remains of which are found in the carboniferous strata of Edinburgh, Glasgow, Leeds, Manchester, Wigan, &c. The teeth and scales resemble very much those of reptiles.

Megalonyx (*μεγας*, large; *ονυξ*, claw).—A fossil genus of edentate animals. See MEGATHERIUM.

Megalornis (*μεγας*, large; *ορνις*, a bird). *The Crane.*—A genus of birds. See ARDEIDÆ.

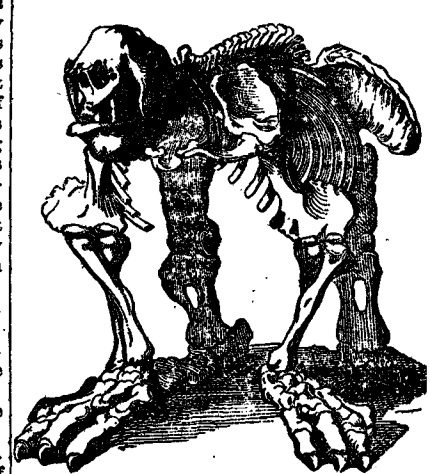
Megalosaurus (*μεγας*, large; *σαυρος*, lizard).—An extinct genus of fossil reptiles. See DINOSAURIA.

Megapodius (*μεγας*, large; *πους*, foot).—A genus of birds belonging to the order *Gallinæ*, family *Megapodidæ*, and sub-family *Megapodinæ*. This genus contains several species which are peculiar to Australia and the large islands of the East. They lay large eggs, which they deposit in cavities dug in the sand, and cover up with a mass of decaying leaves, &c.; and there they leave them to be hatched by the warmth of the mound so raised. One of the species which inhabits New Guinea, *M. Duperreyii*, is about the size of a partridge, is very timid, and runs very fast among the bushes, like a partridge in standing corn. Another which inhabits Australia, and is called by the residents the jungle fowl, *M. tumulus*, is about the size of a common fowl, and the mounds which they rear for hatching their eggs are very large. They have been seen fifteen feet high, and sixty in circumference at the base.

Megaptera.—A genus of whales. See BALÆNIDÆ.

Megasoma (*μεγας*, large; *σωμα*, body).—A genus of beetles. See DYNASTIDÆ.

Megatherium (*μεγας*, large; *θηριον*, animal).—An extinct genus of animals belonging to the order *Edentata* of Cuvier, the fossil remains of



Megatherium of Paraguay.

which have been found in South America. The only species as yet known, *M. Cuvierii*, was a huge animal with a body twelve feet long and eight feet high, and a thigh bone twice the

thickness of that of the largest elephant. The fore foot must have measured more than a yard in length, and was terminated by an enormous claw. The teeth and skeleton generally, show the megatherium to be allied to the sloths and ant-eaters, while its snout appears to have resembled that of the tapir. It lived no doubt upon the roots of plants, and the structure of its feet and legs show it to have been admirably adapted for digging the earth. Nearly allied to this genus of animals the fossil remains of two others have been found in other parts of America. One which has been named *Megalonyx*, and was at first described from imperfect specimens as a carnivorous animal, is found in Virginia, and must have been about the size of an ox. The other, named *Mylodon*, contains three species, one of which was found at Bahia Blanca, in Northern Patagonia, and a second in the United States. A fine restored skeleton of the third, *Mylodon robustus*, is in the British Museum. The bones of many other extinct edentate animals have been found in America, most of which resemble, in many respects, the sloths and ant-eaters.

Melaleuca (μέλας, black; λευκος, white).—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, and consisting of trees and shrubs, natives chiefly of New Holland. Some are also found in India, and several are cultivated in our gardens as ornamental plants. From the leaves of *M. minor*, or *Cajeputi*, is obtained the volatile oil called cajeput. This species, and *M. leucadendron*, are trees which grow to the height of from forty-five to sixty feet, are natives of the Moluccas, and are called by the natives *Cajeputi*, which in the Malayan language signifies white wood. Cajeput oil is a very liquid oil of a grass-green colour, and of a pungent camphoraceous odour. It is capable of dissolving caoutchouc, and is used, especially by the Malays and Chinese, as an external medicament in rheumatism and other affections of the joints. Exhibited internally it acts as a stimulant and antispasmodic, and was considered at one time likely to be a valuable remedy in cholera.

Melampyrum (μέλας, black; πυρος, wheat). *The Cow Wheat.*—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*. This genus consists of annual plants which grow in temperate parts of the Old World. Their flowers grow in spikes with leaves intermixed, and are of a yellow or purple colour. The seeds are contained in a capsule. Those of *M. arvense* or purple cow wheat, are black, a circumstance which has given rise to the name for the whole genus. This species grows in corn fields, and is common over the greater part of Europe. The black seeds become often mixed with the corn, and give a black disagreeable appearance to the flour when ground in the mill. The plants themselves are much liked by cows, hence the English name; but as the species of this genus are what are called root parasites, and draw their nourishment from the roots of plants and grasses, it is well not to encourage their growth.

Melanidæ (μέλας, black).—A family of gasteropodous mollusca, equivalent to the genus *Melania* of Lamarck, but now consisting of several genera. The species are spiral, turrited shells, with a horny spiral operculum, and inhabiting fresh water lakes and rivers throughout the warmer parts of the world. The genus *Melania* is the type, the species being numerous, almost all remarkable for their black colour, and with the spire often eroded. The typical species is *M. amarula*, a shell which is found in the Isle of France and Bourbon, Madagascar, and India. The whirls of the shell are crowned with a row of spines, and the animal inhabiting it is said to be of a very bitter taste, and to have been used by the natives of some of the countries in which it occurs as a remedy in dropsy. About 180 species of *Melaniidæ* are described, and about fifty fossil species are enumerated as being found in the miocene formations of Europe.

Melanocorypha.—A genus of larks. See ALAUDINÆ.

Melanorrhœa (μέλας, black; ῥέω, to flow).—A genus of dicotyledonous plants belonging to the nat. ord. *Anacardiaceæ*, and containing only two species which are both natives of India. *M. usitata*, commonly called the Birmese varnish-tree or theetsee, is a native of the Birmese empire, being found at Prome, and along the coast from Tenasserim to Tavoy, and like the other species of the family to which it belongs, abounds in a viscid ferruginous juice which quickly becomes black by being exposed to the air. This juice is collected by the natives, and very extensively used by them as a varnish. With it they pay the seams of their river craft, varnish all sorts of vessels intended to contain liquids, and employ it in the process of gilding. The beautiful pali writing of the Birmese on ivory, palm leaves, or metal, is entirely done with this varnish in its native and pure state.

Melanthaceæ. *The Colchicum family.*—A nat. order of monocotyledonous plants, containing many species which have bulbous or tuberous roots, and are natives chiefly of northern countries. They are in general possessed of poisonous properties, many of them being acrid, purgative and emetic, and some possessing irritant narcotic qualities. See COLCHICEÆ. VERATRIA, &c.

Melastoma (μέλας, black; στομα, mouth).—See MELASTOMACEÆ.

Melastomaceæ.—A nat. order of dicotyledonous plants, containing numerous species which are abundant in tropical countries, and consisting of trees or shrubs. Their flowers are disposed in cymes, and have an elegant appearance. Several species are employed in their native countries, as affording dyes, the bark of some yielding a yellow and others a black dye. The genus *Melastoma* is the type of the family, and

derives its name from the fruit when eaten staining the mouth of a black colour. The leaves of *M. Malabathricum* or Malabar melastoma, possess a degree of astringency which has caused them to be employed by the natives where it grows, as a remedy in cases of diarrhœa, dysentery, and mucous discharges. The juice of the fruit of the species of *Tococca* is used in Guiana as ink.

Meleagrina.—A genus of bivalve shells. See AVICULIDÆ.

Meleagris. *The Turkey.*—A genus of birds belonging to the order *Gallinæ*, family *Phasianidæ*, and sub-family *Meleagrinæ*. The common turkey, *M. gallopavo*, is the type of the genus. Mr. Gould has lately shown that this bird is a native of Mexico, and is the true origin of our domestic species. It appears to have been first imported into Europe by the Spaniards in the year 1530. For many years, however, this species has been lost sight of; and another, closely allied, a native of the United States of North America, has been generally considered the origin of our well known domestic bird. This has lately received the name of *M. fera*, and is much better known to naturalists than the Mexican species. In their wild state turkeys attain a large size, and birds of from twenty to thirty and even forty lbs. weight, are often met with. They are either so timorous or so stupid, that if one be taken and a bit of straw be balanced on his head, it will fancy itself so loaded

Meleagris ocellata—Honduras Turkey.

that it will not venture to move, and if he be placed on a table, his beak held down to the board, and a line drawn with chalk, from the point of his beak so as to catch his eye, he will fancy himself bound so tightly to the table that he will remain spell bound till the line is rubbed out, or his attention be diverted from it. The name of turkey is said to have been given to this bird in England from a mistaken notion that it came originally from Turkey. Every one is familiar with it in a state of domestication, and with the peculiar motions of the turkey cock when inflamed with passion. Immense numbers are reared in Great Britain, especially in Norfolk and Suffolk, from whence they are sent to the London market. The turkey, especially the male, is a handsome bird, but there is another species which is a native of Central America, which is much more beautiful. This is the ocellated or Honduras turkey, *M. ocellata*; a specimen of which was taken alive by the crew of a vessel cutting mahogany in the Bay of Honduras, brought to this country, and presented to Sir Henry Halford. It is nearly equal in size to the common turkey, but the plumage is more splendid, the body being covered with feathers of a metallic green or bronze, variegated with black, gold, and azure blue. Since then several specimens have been brought over and kept for some time alive in the late Lord Derby's park at Knowsley.

Melectidæ.—A sub-family of bees. See APIDÆ.

Meles. *The Badger.*—A genus of carnivorous animals belonging to the family *Mustelidæ*. Three species have been described, but of late two of these have been transferred to other genera, and the common badger now remains the only one in the genus. The badger, *M. Taxus*, is about the size of a middling dog, with a short tail, and an amazingly thick and tough hide. The head is long and pointed, and of a white colour. The upper parts of the body are of a sandy-gray, while the throat, breast, belly, and limbs are of a deep black. The badger inhabits the northern parts of Europe and Asia, though it is not a common animal anywhere. It occurs in Great Britain, and is hunted in some parts of the country during the bright moonlight nights when he goes abroad in quest of food. During the day he sleeps at the bottom of a burrow, which he constructs with his powerful claws, and lines with warm hay. The teeth of the badger show him to be less of a carnivorous animal than most of the family to which he belongs, and accordingly roots and fallen fruits appear to form his chief sustenance. He likewise devours insects, frogs, and eggs of birds, and attacks the nests of the wild bee with impunity, his thick hide rendering him insensible to their stings. The badger is famed for the offensive odour which he emits, arising from a greasy or oleaginous matter which exudes from an aperture opening just beneath the anus. He is, however, an inoffensive animal, and quiet in his manners, though when attacked he defends himself with great courage and resolution. The hide of the badger, when properly dressed, makes the best pistol furniture, the hair is valu-

able for making brushes to soften the shades in painting, and the hind quarters when salted and smoked, make excellent hams. The American badger or brairo, *Taxidea Labradoria*, is about two and a-half feet long from the muzzle to the root of the tail, and inhabits the sandy plains or prairies of North America. It is more carnivorous in its habits than the European badger, his snout is shorter and less pointed, and his body, with the exception of his head and extremities, is covered with remarkably soft, fine, silky fur. He burrows in the sandy soil, or takes possession of the hole made by the *Arctomys*, whom he has perhaps first of all devoured. The American badger is slow and timid, and when pursued takes to the first earth he meets with, burrowing with such rapidity, that he soon puts himself out of danger. The strength of his fore feet and claws is very great. The Indian badger, the bhalboosoor or bear-pig of the Hindoos, *Arctonyx collaris*, is about the size of the common badger, but stands higher on his legs, and has a long truncated snout, like that of a pig. In the make of its body it resembles the bear, but its snout, eyes, and tail are those of a hog. They are scarce animals, and are very fierce.

Melia.—See MELIACEÆ.

Meliaceæ.—A nat. ord. of dicotyledonous plants, containing several species of trees or shrubs inhabiting chiefly tropical climates. A number of them possess acrid, bitter, and astringent principles, some of them being in consequence violent emetics and purgatives, while others are tonic and stimulant. The seeds contain a fine oil which partakes of the bitterness of the plant, though the pulpy fruits of a few are relished as very agreeable to the taste. The genus *Melia* is the type, and the species are almost all trees, the greater part being natives of the tropical parts of the Old World. The best known species is *Melia Azedarak*, the common bead tree, often called false sycamore, Persian lilac, and pride of India. It is a tree which rises to a height of upwards of thirty feet, and has bipinnate leaves, and lilac flowers which are very fragrant. It is a native of Northern India, and is now very much cultivated in the southern parts of the United States of North America. The berries are said to be poisonous, and the root has a bitter, nauseous taste, and is used in the United States as an excellent anthelmintic.

Melicerta.—A genus of minute animals belonging to the class *Rotatoria*. The species are small, nearly diaphanous creatures, and lodged in a tube somewhat conical in shape, and encrusted with earthy matter, which renders it opaque and fragile. *M. ringens* is the best known species, and the tube is formed of uniform small grains, and fixed perpendicularly upon aquatic plants.

Melierax.—A genus of hawks. See ACCIPITRINÆ.

Melilotus.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, and comprising several species which are herbaceous, and useful as fodder for cattle. The common melilot, *M. officinalis*, was at one time used in medicine. It is remarkable for its agreeable smell, which is increased by drying. It is used in making the Swiss cheese called schabzieger. It is ground in a mill and mixed with the curd into a kind of paste, which is put into conical moulds, and there dried.

Meliphaga. *The Honey-Sucker.*—See MELIPHAGIDÆ.

Meliphagidæ.—A family of birds belonging to the tenuirostral tribe of the order *Passeres*, and containing a very considerable number of species, the greater proportion of which are natives of Australia. There they abound in every variety of form, and find a sufficient and never failing support in the luxuriant vegetation of that country. They are characterized by having compressed subulate beaks, and a tongue, the end of which is composed of a great number of delicate fibres, or filaments, exactly resembling a painter's brush. With this peculiar tongue they are formed for sucking up the nectar from the flowers of the eucalypti, and extracting small insects from them, and from holes in the bark. The genus *Meliphaga* is the type of the family, and contains several very interesting species.

Melipona.—A genus of hymenopterous insects belonging to the family *Apidæ*, and characterized by their having the basal joint of the posterior tarsi of a triangular form, entire jaws, and a cylindrical tongue nearly as long as the body. They resemble the bees very much in general form, and like them suck the juice of flowers. They consist of three sets of individuals, males, females, and neuters, though the latter only appear to be known in entomological collections. According to some accounts they differ from the true bees in having no stings, or at least if they do possess the organ, it is in a very rudimentary state. The species are all exotic, being chiefly found in the warmer parts of the New World. Their nests resemble in their structure that of the wasps, in having only one row of cells in each comb. They are well known to the natives of South America, who use their honey as we do that of our hive bees.

Melissa. *The Balm.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing several species of herbaceous plants and under-shrubs, chiefly natives of Europe. The most important species perhaps of the genus is the common balm, *M. officinalis*. It is a very variable plant as to size of stem, and hairiness, and size of leaves and flowers. The whole plant exhales, especially when rubbed, an agreeable odour resembling that of lemon. Its taste is bitter and somewhat aromatic. This plant has been much used in medicine, though now it is only employed as a popular remedy, and administered in infusion, under the name of balm tea, in cases of fever.

Melitophili.—A tribe of beetles. See SCARABÆIDÆ.

Mellite (*mel*, honey). *Honey Stone.*—A mineral substance found in a crystallized state, of a reddish-yellow colour, and a resinous lustre. It may be cut with a knife, and its specific gravity is from 1·55 to 1·66. It occurs in the lignite deposits, and whitens, but does not flame. It consists of mellitic acid, alumina, and water.

Mellifera (*mel*, honey; *fero*, to carry).—A group of hymenopterous insects, comprising the very extensive and interesting families of bees. They are divided into two families, ANDRENIDÆ and APIDÆ—which see.

Mellivora (*mel*, honey; *devoro*, to devour). *The Ratel.*—A synonym of RATELUS.

Melobesia.—A genus of corallines. See CORALLINACEÆ.

Meloe (*μιλας*, black). *The Oil Beetle.*—See CANTHARIDÆ.

Melolontha.—See MELOLONTHIDÆ.

Melolonthidæ.—A family of coleopterous insects belonging to the section *Lamellicornes*. The genus *Melolontha* is the type, and amongst other species contains the well known cockchafer, or May bug, *M. vulgaris*. This beetle is often productive of much mischief to the agriculturist, the larva or grub feeding upon the roots of grasses and other plants, and the perfect insect upon the leaves of trees. In certain seasons, and in some districts, they multiply to such an extent, that they become quite a scourge to the country, and are the source of much misery to the inhabitants. Several small animals, as the weasel, marten, rats, bats, &c., and several birds, especially the jay, the goat-sucker, and the crow, prey upon them and help most materially to keep them under.

Melophagus.—A genus of dipterous insects belonging to the family *Hippoboscidæ*, and containing amongst other species the little creature so well known as the sheep-tick. This insect, *M. ovinus*, is very common in pasture grounds about the commencement of summer. It has no wings, and creeping on to the sheep, fixes its head in the skin of the animal and extracts the blood, leaving a large round tumor. When numerous, they are exceedingly troublesome and difficult to get rid of.

Melopsittacus.—A genus of parrots. See PSITTACIDÆ.

Menispermaceæ.—A nat. ord. of dicotyledonous plants comprising several genera, and a number of species which are twining shrubs, natives of the tropical parts of Asia and America. Many of them are remarkable for their bitter and narcotic qualities, which are owing to the presence of a principle called menispermine. The well known tonic bitter called calumba is obtained from a species belonging to this family—see COCCULUS; and the narcotic substance known as the cocculus indicus is the produce of another, ANAMIRTA; whilst a third species affords to medicine the valuable Pareira brava—see CISSAMPELOS. The genus *Menispermum* gives its name to the family, and contains several species which grow in North America and Central Asia.

Menispermum (*μηνη*, the moon; *σπερμα*, seed).—See MENISPERMACEÆ.

Menobranchus.—A genus of reptiles. See SIRENIDÆ.

Menocera.—A genus of plants. See ELÆOCARPEÆ.

Mentha. *The Mint genus.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and comprising a number of species of highly fragrant herbs found in most parts of the temperate regions of the world, one or two being found scattered over the greater part of the globe. Their flowers are generally small, and collected in many-flowered whirls. The peppermint, *M. piperita*, is one of the most interesting species of the genus. It is a native of Britain and many other parts of Europe, and is also found in Egypt, Asia, and North and South America. Its strong penetrating odour, and its peculiar peppery and camphory taste, leaving in the mouth a sensation of coldness after it, are well known. It is very much employed in medicine, especially as an antispasmodic and aromatic stimulant. The penny-royal, *M. pulegium*, enjoys almost an equal reputation in medicine as the peppermint, and is supposed to possess peculiar powers as an emmenagogue. The spearmint, *M. viridis*, resembles very much the peppermint, and like it is found growing wild in Britain, and many other parts of Europe, at the Cape of Good Hope, in the Canaries, and in both North and South America. From it are prepared a distilled water, a spirit, and a volatile oil; but the aromatic odour is much weaker than that of the peppermint. The aromatic properties belonging to the mints are owing to the presence of numerous glandular hairs situated on the epidermis of the leaves and stem.

Menura. *The Lyre Bird.*—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, family *Certhiidæ*, and sub-family *Menurinæ*. There is only one species known, *M. superba*, the common lyre bird. It is distinguished from all other birds by the splendid plumage of the tail of the male. This consists of sixteen feathers of different sizes and forms, disposed so as to give very much the appearance of the ancient lyre—hence its English name. The habits of this remarkable bird are not very well known, but it appears to be a singing bird, builds a nest in low trees, and lives upon worms and larvæ of insects which it scratches up with its large claws. It is a native of New Holland, living principally in the forests of the *Eucalyptus* and *Casuarina* which cover the Blue Mountains. In the rocky and retired avenues of these wooded hills they take up their abode, reposing perched on trees during the day, and sallying forth at night to search for

food. The lyre bird is about the size of a common hen.

Menyanthes. *The Buck-bean*, or *Bog-bean.*—A genus of dicotyledonous plants belonging to the nat. ord. *Gentianaceæ*, and containing only one species, *M. trifoliata*, the buck-bean, or marsh trefoil. This plant grows in marshy places in many parts of Europe and North America. It is of common occurrence in England, and is, as far as the flowers are concerned, one of the most beautiful of our indigenous plants. The leaves are divided into three long elliptic leaflets, and the flowers, tolerably large, are of a white colour with a blush of red, and the inside of the petals beautifully bearded with corolla-like filaments, which give it a very pretty effect. The whole plant, the root especially, is intensely bitter, owing to the presence of a principle called menyanthine. It forms an excellent tonic, and is much used by the peasantry in stomach complaints. In Lapland the natives collect the fecula of the root, and mix the flour with their bread. In some parts of Germany and England the leaves have been used instead of hops in brewing beer.

Mephites. *The Skunk.* See MUSTELIDÆ.

Mercurialis.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and comprising a number of species of herbs which are chiefly found in Europe. Two are natives of Britain, one of which, *M. perennis*, the perennial mercury, is very common in shady woods, and is considered to be a dangerous plant, and poisonous even to cattle, with the exception of goats. The other, *M. annua*, annual mercury, is equally common, growing in waste places, and at one time had a place in the British pharmacopœia as an emmenagogue. The leaves abound in a mucilaginous juice, and are used on the continent for making a laxative preparation, mixed with honey, and called mercurial honey. It is used in lavements. In Germany the leaves are cooked and eaten as spinach is in this country.

Mercury, Hydrargyrum. *Quicksilver.*—A metal found pure in nature, and also in combination with silver, sulphur, chlorine, and iodine. Native mercury, or quicksilver, is fluid at ordinary temperatures, has a silvery-white colour, and is of the specific gravity of about 13·50. It is found in the quicksilver mines, and appears to exist there as a result of the decomposition of cinnabar, or sulphide of mercury. It only occurs in small quantities. The combination of silver with mercury, forming *Native Amalgam*, is also found in small quantities in the same situations. The dichloride of mercury, so well known as *Calomel*, is occasionally found native in some of the mines in the form of small concretions. This substance, however, is always in small quantity, and the calomel of medicine is artificially prepared. The chief ore of mercury is the sulphide, or sulphuret, commonly called cinnabar, and vermilion. Cinnabar is found in granular or compact masses, is of a fine red colour, and when powdered presents the hue of bright scarlet. Its specific gravity is 8·098. It is the only ore which is worked for obtaining the mercury of commerce. The most important mines are those of Almaden in Spain, and of Idria in Carinthia; but there are mines also in Hungary, Transylvania, and Germany. Of late large quantities of this ore have been found in Mexico and Peru, and China and Japan have long been known to contain it. The European mines have been considered to produce at an average about 2,000 tons annually. Mercury was known to the ancients from the earliest times, and it was, of all the metals known, the one most used by the alchemists of old in their vain attempts to transmute the baser metals. Mercury boils at a temperature of 360° or 365°, and freezes at —40°. The salts of mercury are some of them very much used in medicine, as the dichloride, or calomel, and the chloride, or muriate, corrosive sublimate. It combines with various metals forming amalgams. An amalgam of mercury and tin is used for silvering mirrors and looking glasses. With bismuth an amalgam is formed which is employed to silver the inside of bottles and glass globes. An amalgam of mercury with lead, tin, and bismuth, is used for anatomical injections; and mixed with tin and zinc it is employed to increase the electric power of the plates of glass in their friction against the body of electrical machines. Mercury is of very great importance in extracting gold and silver from the ores which contain these precious metals. It possesses the property of dissolving them, and being readily separated again from them by the application of heat. It is in consequence of immense utility to the workers in gold and silver mines.

Mergus.—A genus of birds belonging to the order *Anseres*, and family *Anatidæ*. The birds belonging to this genus are known by the names of merganser, or goosander. They are inhabitants of the northern regions, and of America, and their food consists chiefly of fish.

Meriones.—A genus of animals belonging to the class *Mammalia*, order *Rodentia* or *Glires*, and family *Jerboidæ*. The species are natives of North America, and have a long slender tapering tail, covered with short, slightly rigid, hair. *M. Canadensis* is extremely agile, but passes the winter in a state of lethargy in its burrow.

Merlangus. *The Coal-fish* and *Whiting.*—See GADIDÆ.

Merluccius. *The Hake.*—See GADIDÆ.

Meroe (an island of the Nile).—A genus of shells. See VENERIDÆ.

Meropidæ. *The Bee-eaters.*—A family of birds belonging to the fissirostral tribe of the order *Passeres*, and distinguished by their being generally of a green colour, and by their having long slightly arched beaks, and long pointed wings. They associate in flocks, and fly like swallows, pursuing bees and wasps, which they

prey upon with impunity. They are only found in the Old World and Australia. The genus *Merops* is the type of the family, and the best known species is the European species, *Merops apiaster*, or common bee-eater. It is an elegant bird with brilliant plumage, and is a native of the warmer parts of Europe, especially the islands of the Grecian Archipelago, and of many parts of Africa and Asia.

Merops.—See MEROPIDÆ.

Merula. *The Blackbird.*—See TURDIDÆ.

Merulius.—A genus of fungi. See THALLOGENÆ.

Mesembryanthemum.—A genus of dicotyledonous plants belonging to the nat. ord. *Ficoideæ*, or *Mesembryaceæ*, comprising a good many species of mostly shrubby, rarely herbaceous, succulent plants, which chiefly grow at the Cape of Good Hope. They are known by the name of fig marigolds. The leaves of *M. edule*, the Hottentot's fig, are used as an article of diet, and *M. emarcidum* is fermented by the Hottentots, when it becomes narcotic, and is chewed by them like tobacco. *M. crystallinum* is known by the name of the ice plant, and is remarkable for the watery vesicles which cover its surface, and which shine in the sun and present the appearance of pieces of ice. It is a native of the Cape of Good Hope, and is also found growing in the Canaries, and in Greece.

Mespilus. *The Medlar.*—A genus of plants belonging to the nat. ord. *Rosaceæ*, sub-family *Pomeæ*, and containing a number of species which are trees and grow in Europe. The common medlar, *M. Germanica*, is a native of various parts of Europe and Siberia. It is found wild in Great Britain, and is cultivated on account of its fruit. This is only eaten when it is in a state of decay, has a very peculiar flavour, and by many people is greatly esteemed. By some botanists the hawthorns are considered to belong to this genus. See CRATÆGUS.

Mesua.—A genus of plants. See CLUSIACEÆ.

Metrosideros (*μητρα*, the heart of a tree; *σιδηρος*, iron). *Ironwood.*—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*, comprising a number of trees, or shrubs, natives of Australia and the South Sea Islands. *M. vera*, the true ironwood, is a native of Java and Amboyna. The wood of this tree is very hard, and is much valued by the Chinese and Japanese for making anchors and rudders, &c., for their ships and boats. *M. polymorpha* is a species which grows in the Sandwich Islands, and is said to be the tree from which the natives make their war clubs. *M. buxifolia* is a rambling shrub, creeping up the loftiest trees in several parts of New Zealand. It is called aki, or the lignum vitæ of New Zealand, and the wood is very hard.

Meum. *The Bald Money.*—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and containing two species which are natives of Europe; one of them, *M. athamantum*, or common bald money, being found in Great Britain. The roots, seeds, and every part of the plant, are aromatic, and are used as stomachics and carminatives, and enter into the composition of the preparation called Venice treacle.

Mica.—A mineral substance found disseminated through all formations, and forming an essential part of several rocks, such as granite, gneiss, mica schist, &c. It is found, in general, in rocks or sand, in small brilliant scales of a silvery lustre, or of a golden-yellow hue, and often mistaken by the ignorant for pieces of gold or silver. In some places it is found foliaceous, or in large transparent plates, sometimes more than six feet in diameter. The large plates are called Muscovy glass, and are used extensively in Russia and Siberia as a substitute for glass. It is said the Russian men-of-war ships used to have their windows or sashes made of this material, because it does not fracture as glass does by the detonation of their guns.

Microlæna. A genus of plants.—See BYTTNERIACEÆ.

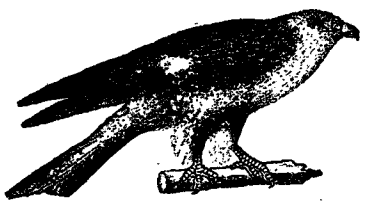
Mikania.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ* and sub-order *Corymbiferæ*. Several species are useful in medicine. *M. officinalis* is a handsome plant, and is a native of Brazil. The leaves contain a bitter principle and an aromatic oil, and are used in the same way and for the same purposes as the cascarilla and cinchona barks. The guaco plant, *M. Guaco*, is a native of South America also, and is used both internally and externally as a remedy against the bites of poisonous serpents. It is cultivated by the Indians for this purpose.

Miliola.—A genus of minute rhizopods. See FORAMINIFERA.

Milleporidæ (*mille*, a thousand; *pori*, pores).—A family of stony corals, equivalent to the genus millepora of Linnæus, and containing a good number of genera, and many species which are characterized by their having, instead of lamellar cells for the polypes, a great number of simple pores. In some of the genera these pores are polygonal, and several of them are only known in a fossil state, such as the genus *Favosites*, &c. Others have the pores rounded and immersed, and the greater number are fossil also, as *Orbitolites*, &c. A third set have the pores round and more or less tubular and prominent. A few species are recent but the majority are from the oolite and chalk. The genus *Hornera* contains several recent species from the seas of Europe and Australia, and more fossil from the tertiary formations.

Milvinæ. *The Kites.*—A sub-family of birds belonging to the order *Accipitres*, and family *Falconidæ*. The birds of this family are known from the other groups of the *Falconidæ* by their

excessive long wings and forked tails. Their tarsi are short and feathered below the knee, and the beak is generally moderate sized and rather weak. The genus *Milvus*, which gives the name to the sub-family, may be taken as the type; and the common kite, *Milvus vulgaris*, is perhaps the



Milvus vulgaris—The Kite.

best known species of the group. The kite or glead is about twenty-six inches long, the female always larger than the male, and is found throughout great part of Europe, in Siberia, Egypt, and the north of Africa. It is not uncommon in Great Britain, and its movements in the air are very graceful. At one time it may be seen describing circles in its flight, and at another appears to hover without making any effort to support itself, so easy and elegant is its motion. At this very time however, it is keenly watching its prey below, and then suddenly pounces upon it with great velocity. Its ordinary food consists of moles, mice, leverets, rabbits, and unfledged birds. When more common than it is now in this country, it used to be the dread of the poultry yard, as young chickens, ducklings and goslings were its favourite prey. In the reign of Henry VIII., kites were very numerous in London, and were encouraged by the inhabitants in the same manner as similiar birds, the adjutants, &c., are in the towns of India at the present day. They destroyed the offal which used to be thrown into the streets, and so useful were they as scavengers that it was forbidden to kill them. The kite was also used in former days in falconry. The bill of the birds of this family, as has been mentioned above, is weak; in consequence of which many of the species appear to live principally upon insects. The Mississippi kite, *Ictinia Mississipiensis*, a native of North America, according to the accounts we have of its habits, feeds chiefly upon cicadæ, locusts, and beetles, and may be seen in certain localities sweeping about the trees in search of insects in the manner of swallows. The black winged swallow-hawk also, *Elanus melanopterus*, a native of Africa from Egypt to the Cape, lives principally upon insects which it catches upon the wing; and the swallow-tailed hawk of America, *Nauclerus* (*Milvus*) *furcatus*, common in the southern states, may be seen soaring high up in the air in calm and clear weather, pursuing the large insects called mosquito-hawks, and performing the most singular evolutions that can be conceived, using their long forked tail with a peculiar elegance of motion. The honey buzzard, *Pernis apivorus*, belongs to the family of kites, and is one of the most elegant of the birds of prey that visit Great Britain. It is a native of many parts of Europe, and also of oriental countries. It feeds upon insects, but preys likewise upon small birds, and quadrupeds, as field mice, moles, hamsters, &c. It appears to have acquired its name from a great portion of its food consisting of the larvæ of bees and wasps, to obtain which, the receptacles containing them are scratched out and broken up, or portions of the comb carried bodily to their nest. The honey buzzard seldom flies, except from one bush to another, but runs on the ground with great swiftness like the common fowl.

Milvus. *The Kite.*—See MILVINÆ.

Mimosa (*mimus*, a comedian).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and deriving its name from its containing, when first established, many species very different from each other, and assuming a great variety of appearances. The genus is now subdivided, and forms, instead of a single genus, a sub-family under the name of *Mimoseæ*. The genus *Mimosa*, however, is still retained, forming the type of the sub-family, and in its restricted sense even now contains about 220 species, which are either herbaceous plants or shrubs, some even growing to the height of considerable sized trees. The leaves are compound or bipinnate, and the flowers are small, sessile, and agglomerated into small round heads, which have the appearance of little silky tufts in consequence of the great number of long slender stamina. The sensitive plant, so well known under that name, was originally described as *M. sensitiva*, but several species possess the sensitive property, and are so near each other, that it is difficult to refer the species to its true type. The most common and abundant sensitive species is a small prickly somewhat shrubby plant found growing all over tropical America, and is now described under the name of *M. pudica*. The principal genus, however, of the sub-family *Mimoseæ* is the ACACIA—which see.

Mimulus (diminutive of *mimus*, a comedian; from its corolla resembling a mask).—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, containing about thirty species of herbaceous plants, all remarkable for the beauty of their often brilliant coloured flowers. The chief part are natives of America, and many of them are much cultivated in our gardens as ornamental plants. They have a bilamellate stigma, the two lamellæ of which are irritable, and close when irritated. One of the species, *M. luteus*, is a native of South America, growing chiefly on the west coast and being found along the shores of Chili, and upwards as far as California. It has been long cultivated in our gardens, and having frequently made its escape from

them, is now almost naturalized in many parts of Great Britain. Another species, a native about the Columbia River on the north-west coast of America, exhales a strong smell of musk, and is cultivated in this country for the sake of its odour.

Mimus (*mimus*, a mimic).—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Turdidæ*. The mocking bird, *M. polyglottus*, is a well known species, and is remarkable for its vocal powers and faculty of imitation. Its voice is full, strong, musical, and capable of almost every modulation, from the clear mellow tones of the wood thrush to the savage scream of the bald eagle. Those who have heard this bird in his native woods, assert that in song it is far beyond the nightingale. The mocking bird is a native of America and the West Indies, builds its nest in fruit trees in the immediate neighbourhood of the habitations of man, and feeds on berries and fruits. One or two other species, inhabitants of South America, have been described, but in powers of song are far inferior to the *polyglottus*.

Mimusops (*mimus*, a mimic; ὤψ, appearance).—A genus of dicotyledonous plants belonging to the nat. ord. *Sapotaceæ*, and containing about thirty species of trees which exude a milky juice, and are natives of Asia and tropical Australia. One of the most remarkable species is *M. Elengi*, a native of India, and a tree that grows to a considerable height. It bears a fruit which is fleshy and red when mature, and has a sweet and slightly astringent taste. It is cultivated in India for the sake of its fragrant flowers, from which a sweet scented water is distilled. The seeds yield an abundance of oil in request for painters, and the natives prepare a kind of tea from the leaves, which has a pleasant odour and is considered to have febrifuge qualities. They are said also to produce an extraordinary noise when burnt.

Mineralogy (*mineral*, and λογος, a discourse).—That branch of natural history which treats of the composition, the properties, and particular characters of those inanimate and inorganic substances which are formed naturally without the aid of vital forces or the operations of art, and found abundantly scattered over the surface and in the interior of the earth, called *Minerals*. It treats also of the situations where they are found, their employment and uses, and the method of classifying and arranging them. The total number of species of minerals known at the present time is upwards of 600.

Miopithecus (μειων, small; πιθηκος, ape).—A genus of monkeys. See CERCOPITHECINA.

Mirabilis.—A genus of dicotyledonous plants belonging to the nat. ord. *Nyctaginaceæ*, and comprising a small number of species which grow in tropical America. They are herbaceous plants, with tuberous roots, and fine large flowers which generally blow during the night. Hence they receive the name in France of "belle de nuit." One of the species, *M. Jalapa*, has received its specific name from its having been at one time believed to yield the well known purgative root called jalap. The root is large, fusiform, and tuberous. It is a native of Peru, as well as another species, *M. dichotoma*, which is commonly called the "marvel of Peru." In the West Indies it is known by the name of "four o'clock," from its opening its blossoms at that hour in the afternoon. This genus is also named *Nyctago*, which some botanists retain—and it gives its name to the family.

Miracidæ.— A family of entomostracous *Crustacea*. See COPEPODA.

Mitra.—A genus of *Mollusca* belonging to the class *Gasteropoda*, and family *Volutidæ*. This genus has of late been much dismembered, but it still contains a considerable number of species. The shells are generally turreted or fusiform, with a pointed spire, and several pleats on the columella. The animals are remarkable for the length of their proboscis, and the eyes are placed on the tentacles or at the base. They emit a purple liquid, having a nauseous odour when irritated, and their operculum is very small. The species are almost all confined to the seas of warm climates, and are sometimes of lively colours, and occasionally attain a considerable size.

Mocha Stone. *Moss Agate.*—See AGATE.

Modiola.—A genus of bivalve shells. See MYTILIDÆ.

Molgula.— A genus of ascidians. See TUNICATA.

Mollusca (*mollis*, soft).—A sub-kingdom of animals characterized by their being soft, fleshy, and destitute of any bony skeleton supporting jointed limbs, or of any hard, ringed skin. They are covered with a muscular coat, called the mantle, endued with a glairy humour, and walk, or rather glide along, on a single central foot, or disc. Their nervous system consists of a certain number of medullary masses or ganglions, distributing fibres to different parts of the body, one of the masses being placed over the gullet, and enveloping it like a collar. On the surface of the body are certain glands, which secrete in certain points of its surface, or in its thickness, calcareous or horny particles, which assume the shape of a shell of one or more valves, very generally covering the whole body of the animal. The mollusca are divided into several classes according to their structure. Those with a shell of one valve are called univalves, and are furnished with a distinct head—hence they are said to be *encephalous*. They are divided into three classes, founded on the modifications of their feet: I. CEPHALOPODA, *the cuttle-fishes*, with their feet, or, more properly speaking, arms, attached to the head, forming a circle round the mouth. II. GASTEROPODA, *the snails*, with the under side of the body forming a single muscular foot, or

which the animals creep or walk. III. PTEROPODA, which swim in the sea with a pair of fins, extending outwards from the sides of the head. The bivalve shells are *acephalous*, or have no distinct head, and are divided into two classes, characterized by modifications in their breathing organ and shell. I. CONCHIFERA, or *ordinary bivalve shells*, which breathe by two pairs of gills, in form of flat membranous plates attached to the mantle, and have one valve of the shell applied to the right, and the other to the left side of the body. II. BRACHIOPODA, which have a mantle that performs the office of gills for breathing, and which have one valve of the shell placed on the back, and the other in front of the animal. Another class, which is destitute of a distinct head also, have no shell, but are protected by an elastic, gelatinous tunic, with two orifices; the breathing organ takes the form of an inner tunic, or of a riband stretched across the internal cavity. This class is called TUNICATA. The BRYOZOA, which were formerly ranked amongst the zoophytes, are now placed amongst the mollusca, and form an order of the *Tunicata*.

Molothrus.—A genus of birds belonging to the conirostral tribe of the order *Passeres*, and family *Sturnidæ*. One of the species belonging to this genus, *M. pecoris*, is a bird of curious habits. It is a native of America, where it is known by the names of the cow-pen bird, cow-bunting, cow-blackbird, and cow-troopial. It leads a wandering life, and is a constant attendant upon the cattle in the fields, picking up the insects disturbed by the quadrupeds, or which haunt their droppings. Like our cuckoo, this bird never prepares a nest for itself, but deposits her eggs in those of other birds. It would appear that the foster parent hatches this egg before any of her own are ready, and that when the legitimate offspring are born, they are smothered by the intruder.

Molybdenum.—A metal discovered by Scheele in 1778, in a mineral which resembles plumbago. This mineral is the sulphuret or bisulphide of molybdenum, and is known by the name of *Molybdena* or *Molybdenite*. It occurs crystallized and massive, and is found in granite or gneiss in Saxony, Bohemia, Cornwall in England, the United States of America, and Norway. It stains paper when rubbed upon it, is flexible in thin laminæ, but not elastic, and has the specific gravity of 4·591.

Momordica.—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*, and which formerly contained the plant which affords the well known substance called *elaterium*. This plant now belongs to the genus ECBALIUM. The species still belonging to *Momordica* are herbaceous, climbing plants, natives of Asia and tropical America. *M. balsamina* is cultivated in gardens in Europe, and has a fruit about the size of a large plum, which is considered emetic. *M. operculata* is a common native of the coast of Essequibo, and is one of the bitterest of all known substances.

Momotus = Prionites. *The Motmots.*—A genus of birds belonging to the fissirostral tribe of the order *Passeres*, and family *Coraciidæ*. They are characterized by having a long, strong, and thick beak, a little compressed laterally, inflected at the point, and having the edges crenulated. Their tongue is long, narrow, and barbed on the edges. There are several species, natives of Brazil, where they live in the interior of the forests, and are wild and bold birds. They build their nests in holes in the ground, made by the armadillos or other burrowing animals, and line them with dry herbs. They are generally seen reposing on the lowest branches of trees near their retreats, watching for passing insects, upon which they dart. They feed also upon worms, small birds, and eggs. They have a disagreeable monotonous cry, which resembles the words hou-tou or tu-tu, slowly pronounced at regular intervals.

Monacanthus (*μονος*, one; *ακανθα*, spine).—A genus of fishes. See BALISTIDÆ.

Monadina.—A family of minute organisms, consisting of a heterogeneous group of imperfectly examined bodies, classed by authors amongst the *infusoria*, but of which many of the species appear to be merely the zoosperms or lower forms of *algæ*. They are composed of a homogeneous, glutinous substance, without any integument or outer covering, and have no other organs visible but one or more long and slender filaments, which act as organs of locomotion. The genus *Monas*, which gives the name to the family, contains some of the smallest of all the species of infusoria; and their filaments or organs of motion are only about a $\frac{1}{3000}$th of a millimetre in size. Indeed they can scarcely be recognized by even a high magnifying power, except by the motion which their action causes in the water. They have neither mouth nor eyes. Some of them possess the power of agglutinating themselves to other objects, and drawing their bodies out so as to change their form. They multiply by self-division of the body into one or more portions, which become separate and distinct animals. The *Monas crepusculum* is said to be the most minute of all known living beings. Within the narrow space of a grain of mustard seed, the diameter of which does not exceed the tenth of an inch, eight millions of these little creatures can exist. The monads are very common in all infusions of either animal or vegetable substances. Some of them have only one filiform appendage, others have two or more. Some live single or isolated, forming the restricted genus *Monas*. Others live in groups, forming clusters in shape of a mulberry, forming the genus *Uvella*.

Monarda.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and comprising a few species which are herbs, natives of North America, and all remarkable for the beauty

or their flowers. These are very numerous, disposed in whirls, close set, accompanied by bractese, and of a lively red or purple colour. One species, *M. didyma*, is well known by the name of Oswego or Pennsylvania tea, from the residents using the leaves as a substitute for the true tea. *M. fistulosa* is a bitter plant, and is employed as a remedy in intermittent fevers.

Monas.—See MONADINA.

Monitoridæ (*monitor*, one who warns). *The Monitors.*—A family of scaly reptiles belonging to the order *Saura* or lizards. The animals belonging to this family have a long, deeply forked tongue, which, like that of the snakes, is capable of being withdrawn into a sheath placed at its base, and the head, body, and limbs are covered with small scales. They are only found in the warmer parts of the Old World, living near the water's edge, and are venerated by the natives, who assert that they give notice of the approach of the crocodiles by hissing when they perceive one of these animals—hence their name, *monitor*. The Nilotic monitor, *Monitor Niloticus*, is, as its name imports, a native of the Nile; and representations of it are found on the monuments of the ancient Egyptians.

Monocephalii (*μονος*, one; *κεφαλη*, head).—A family of double monsters, belonging to the order *Autositarii*, characterized by the individuals having only one head, but two bodies, which are blended together more or less intimately, to a greater or less extent. The degree of this fusion of the bodies gives rise to a division into three distinct generic forms:—1. *Deradelphus* (*δειρη*, neck; *αδελφος*, brother), where the trunk, single above, is divided into two below the umbilicus, and has three or four thoracic members. In cases of this sort there are not only two spinal marrows, but the *medulla oblongata* is double, and they continue distinct even to their upper extremities. They have not only two spinal columns, and two spinal canals, but two occipital foramina, each giving passage to a distinct medulla oblongata. Cases of this kind occur occasionally in the cat, dog, goat, and other animals, but are very rare in the human subject. 2. *Thoradelphus* (*θωραξ*, trunk; *αδελφος*, brother), where the trunk, single above, and separated below the umbilicus, has only two thoracic members. In this genus there is only one series of cervical vertebræ, and one cervical portion of spinal marrow, and the bifurcation of the two spinal columns only commences towards the middle of the back, or even below it. Cases have only been known to occur in the dog and calf. 3. *Synadelphus* (*συν*, with; *αδελφος*, brother), where, though there is only one trunk, it is double in all its parts, and has eight members, four of them dorsal, and directed upwards. There is only one head, but the increased size of the posterior part, and the large size of the occipital foramen, show that two brains have been fused into one. The neck is thick, and the spine is double, and there are two spinal marrows. The organs in the chest are all double; and these monstrosities are also characterized by their having two distinct navels. The cases of this kind are very rare, having only been noticed in one or two of the lower animals.

Monochlamydeæ (*μονος*, one; *χλαμυς*, covering).—A sub-division of plants. See COROLLA.

Monocotyledones (*μονος*, one; *κοτυλη*, cotyledon).—A great division of plants, characterized by the species having their seed *not* divided into two embryos, but possessing only one. They are synonymous with *Endogens*. To this division belong the palms and grasses, &c.

Monoculi (*μονος*, one; oculus, eye).—A name by which all the entomostracous *Crustacea* were formerly known.

Monodon (*μονος*, one; *οδους*, tooth).—The narwhal. See DELPHINIDÆ.

Monomphalii (*μονος*, one; *ομφαλος*, navel).—A family of double monsters, belonging to the order *Autositarii*, characterized chiefly by the almost complete union of two individuals, by means of a common umbilicus. These monsters may be either united beneath the navel or above it. In the first group there is only one generic form, *Ischiopages* (*ισχιον*, ischium; *παγις*, united), where the individuals composing it have a common umbilicus, and the bodies united in the hypogastric region. This is not at all an uncommon monstrosity, both in man and the lower animals. In the second group there are four varieties of form:—1. *Xiphopages* (*ξιφος*, xiphoid cartilage or end of sternum; *παγις*, united), where the union of the individuals takes place at the inferior extremity of the sternum, and in which the common umbilicus exists as in the others. This is not a rare case either in human beings or the lower animals. The celebrated case of the Siamese twins was an example of this kind. 2. *Sternopages* (*στερνον*, sternum; *παγις*, united), where the union takes place by the junction of two individuals face to face, from the umbilicus as far as to the upper part of the chest. This case also takes place pretty often both in man and quadrupeds. 3. *Ectopages* (*εκτος*, outside; *παγις*, united), where two individuals are united laterally throughout the whole extent of the chest, from the umbilicus upwards. The cases of this kind are rare, and have only been seen in the human subject. 4. *Hemipages* (*ημισυς*, half; *παγις*, united), where the union takes place laterally throughout the whole extent of the chest and neck, and as far as the jaws. These cases are rare. The examples of *Monomphalii* are generally very short lived, only a few instances having occurred to the contrary, such as the Siamese twins, &c.

Mopalia.—A genus of gasteropodous *Mollusca*. See CHITONIDÆ.

Morchella. *The Morel.*—A genus of acoty-

ledonous plants belonging to the nat. ord. *Fungi*, and containing one species, *M. esculenta*, the common morel, which is eatable. Of this mushroom there are several varieties. They are found in woods, orchards, and cinder walks, and are believed to be more plentiful in places where fires have been made. The morel has a slight smell and an agreeable taste, and many people esteem it as an article of food as highly as they do truffles. In Germany great quantities are brought to market. *M. pleopus*, another species, is poisonous.

Moringa.—A genus of dicotyledonous plants belonging to the nat. ord. *Moringaceæ*, and being the only genus the family contains. There are several species, all trees without thorns, and with pinnate leaves, and natives of the East Indies and Arabia. A very good oil, without smell, but which has the advantage of not becoming rancid by keeping, is obtained from the seeds of *M. pterygosperma*, the horse-radish tree, and which is known by the name of oil of ben. It is used by perfumers as the basis of various scents; and as it does not readily freeze, it is much employed by watchmakers. It is a native of India; and the flowers, leaves, and other parts of the plant are added to curries. The root is pungent and stimulant, and resembles horse-radish in taste.

Morisonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Caparidaceæ*, and consisting of trees which are natives of the West Indies. The roots of *M. Americana* are long, thick, tough, compact, and heavy, and are used by the natives of America to make their war clubs.

Mormyridæ.—A family of malacopterygious fishes, found in the rivers of both sides of Africa, the Nile, Senegal, and Congo. They have rather large, compressed bodies, with a tail slender at its origin, but swelling out at the attachment of the caudal fin. Their head is encased in a thick, naked skin, which envelops the gill cover and branchiostegals, and leaves only a perpendicular slit for a gill opening. About twenty-six species have been described, most of them belonging to the typical genus *Mormyrus*. The species are timid fish, of nocturnal habits, frequenting rocky basins in the rivers. They are much prized, however, as articles of food by the epicures of Egypt, as the flesh has an excellent flavour, and seem to have been objects of as great attention to the ancient inhabitants of that country as to the present race. Figures are to be seen in some of their ancient monuments; and mummied mormyri are not uncommon. The best known species is *M. oxyrhynchus* (*Centriscus Nilóticus*), a fish of a blue colour, with a red head, and about two feet in length. They are brought in great quantities to the market at Cairo, and were at one time regarded by the Egyptians as objects of veneration. They were worshipped, and had a temple dedicated to them. Another species, *M. longipinnis* or *M. caschive*, has been found to possess electric organs.

Mormyrus (*μορμυρω*, hideous; *ουρα*, tail).—A genus of fishes. See MORMYRIDÆ.

Morphnus.—A genus of hawks. See AQUILINÆ.

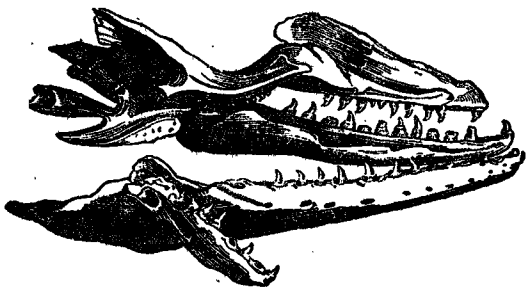
Morrhua. *The Cod-fish.*—See GADIDÆ.

Morunga.—A synonym of *Macrorhinus*. See PHOCIDÆ.

Morus. *The Mulberry.*—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and sub-order *Moreæ*, comprising a number of trees or shrubs, containing a milky juice, and growing wild in warm climates in different quarters of the world. The fruit of several are edible; of such especially is that of *M. nigra*, the black or common mulberry, a tree which grows to a considerable height, and is believed to be originally a native of Persia or China. It is now cultivated generally throughout Europe, though the date of its introduction is unknown. The fruit of the mulberry is well known and very agreeable. In other respects, this tree is not of much importance economically; but the white mulberry, *M. alba*, is of great value, on account of its leaves furnishing the chief food of the silkworm. It was originally a native of China, but is now naturalized in Asia Minor and the south of Europe. The commencement of the silk manufacture in China is said to date 2,700 years before Christ. Several centuries afterwards it spread to India, Persia, &c.; and the mulberry trees, in consequence, began to be cultivated along with it. Though the leaves, as food for the silkworm, form the principal value of this tree, the wood is also much esteemed by cabinetmakers. The leaves of the many-stemmed mulberry, *M. multicaulis*, are also used as food for the silkworm. This species is a native of the Philippine Islands, and has been introduced into India and Europe. In the south of Europe it is now superseding the white mulberry, as it surpasses all the varieties of that species in the greater abundance of leaves.

Mosasaurus.—A genus of extinct fossil animals belonging to the class *Reptilia*, and order *Saura*. It is nearly allied to the *Monitoridæ*, but was marine. When the head was first discovered, it was considered to be a crocodile; the structure of the teeth, however, and the other parts of the skeleton, since brought to light, clearly point out its close relations to the monitors, though differing most materially from the recent species in size. The head here represented measures four feet in length, whilst that of the largest monitor does not exceed five inches. The only species described, *M. Camperi*, must have been twenty-five feet long; and its remains were found in the calcareous freestone near Maestricht. When this town was besieged by the French, their artillerymen had orders not to point their artillery towards that part of the city in which this specimen was

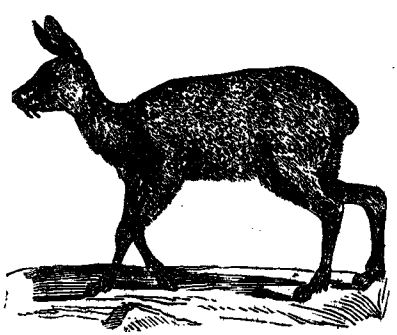
kept; and when the town was captured, the specimen was given up to them and carried to Paris. From the structure of the skeleton, and the head



Head of Mosasaurus.

and teeth, this animal must have been very active and very destructive.

Moschina. *The Musk Deer.*—A tribe of ruminant animals belonging to the great family *Bovidæ*, and distinguished from the *Cervina* by the absence of horns, and the presence of long canine teeth in upper jaw. The males of some of the species have a bag or pouch beneath the abdomen, for secreting an odoriferous matter called musk. These belong to the true genus *Moschus*. Others have none; such are the genera *Meminna* or *Tragulus*. The animals belonging to this tribe are small, and very swift and elegant in their movements; but little of their habits is known. They are confined to the Old World. The true musk, *Moschus Moschiferus*, is the most celebrated of all the tribe, but at the same time is one of whose habits we know the least. It is about the size and form of a roebuck, is a shy and timid creature, and inhabits the mountainous regions of the centre of Asia, as Tibet, and the



Tragulus pygmæus—The Kanchil.

upper provinces of China. The musk pouch is peculiar to the male, and is about three inches in diameter. The best musk is obtained from Tibet. It is perhaps the strongest and most pungent of perfumes, and was at one time much used in medicine in nervous and convulsive complaints.

The kanchil, *Tragulus pygmæus*, is the smallest of all the ruminants, not being larger than a hare. In its form and appearance, however, it is remarkably elegant, is extremely swift, and leaps very high. When pursued it is said to leap to such a height that it fastens itself by its curved canine teeth to the branches of trees, allowing the animals which pursue it to pass underneath. The meminna, or pisora, *Meminna indica*, is an elegant and graceful little creature, very timid and gentle, and is a native of various parts of India, Ceylon, and Java. The flesh is said to be excellent. The napu, *Tragulus Javanicus*, is another exquisite little creature, about the size of a hare, and well known to all voyagers in the Straits of Malacca under the name of the "mouse deer." It is a native of Java and Sumatra, frequenting thickets near the sea shore, and feeding principally upon the berries of a species of *Ardisia*. When taken young it may be made quite tame and familiar.

Motacillina.—A sub-family of birds belonging to the dentirostral tribe of the order *Passeres*, and containing the wagtails. They are characterized by an elongated and slender bill, long and pointed wings, and a tail generally very long and narrow, which they are continually shaking up and down. Their tarsi are elevated, and their hind toe is long, and armed with a long claw. They are generally seen frequenting the margins of rivers, inundated fields, &c., and their food consists of insects and small seeds. They are active and graceful birds, their tails never ceasing to vibrate as long as their restless little bodies are in action. No species of this family have been seen in America, and they appear to be confined to the Old World, though there they are found in Europe, Asia, and Africa. The genus *Motacilla* is the type of the family, and contains those species which are well known as the true wagtails, the "*Hochequeues*" of the French. The common wagtail of this country, the water wagtail, or pied wagtail, has only of late years been proved to be a distinct species from that of the continent, though nearly allied to it. Norway and Sweden appear to be the only parts of Europe, independent of the British isles, where this bird, *Motacilla Yarellii*, has as yet been found. In the temperate parts of Europe its place is supplied by the allied species *M. alba*. The habits of the two species are very much the same. They may be seen when the cows are feeding in the moist low pastures running round them, close up to their noses, and under their very bellies, availing

themselves of the flies that settle on their legs, and probably finding worms and larvæ that are roused by the trampling of their feet. Hence the name of "Bergeronettes," applied to them by the French. A species, resembling in its habits and manners the European *Motacillæ*, is found in Java. This bird, *Enicurus speciosus*, is about four and a-half inches long, exclusive of the tail, which is six inches more. It is of a black colour, variegated with the purest snow-white, is found near rivulets, and may be seen running along in the beds of such as abound in rocks and gravel, moving its tail incessantly, and picking up worms and insects.

Mucedines. — A family of acotyledonous plants belonging to the hyphomycetous *Fungi*, well known by the names of mould and mildew. The family includes a number of the most interesting of the microscopic fungi which attack living or decaying animal or vegetable substances, and exert a powerful destructive influence upon them, contributing very much to their decomposition. The species of *Botrytis* and *Oidium* spread with wonderful rapidity as mildews over the herbaceous parts of vegetables, and moist vegetable substances generally, and carry decomposition and decay into all their soft structures. They are most abundantly developed in a close damp atmosphere. Other kinds, as the species of Penicillium, form in liquids containing organic matter, or upon decaying vegetable substances, and produce remarkable chemical decompositions, causing a fermentation of the medium in which they exist. See BOTRYTIS, OIDIUM, and PENICILLIUM.

Mucor. *Mould.*—A genus of acotyledonous plants belonging to the physomycetous *Fungi*, and forming the type of the family *Mucorini*. The species are well known as forming the moulds seen springing up on paste, decaying fruits, or other vegetable matters. The most common species is *M. mucedo*.

Mucuna. *The Cowitch.*—A genus of plants. See DOLICHOS.

Mugil. *The Gray Mullet.*—See MUGILIDÆ.

Mugilidæ. *The Mullet family.*—A family of fishes belonging to the order *Acanthopterygii*, and containing two or three genera, of which *Mugil*, the gray mullet, is the type. The species of the family *Mullidæ* are also known by the name of *Mullets*, but as will be seen under that word, the appellation of *Surmullets* has been retained for that family, and that of *Mullets* will designate the present group. The species of this genus are of a cylindrical shape, with a broad back, and their body is covered with large scales, which cover the depressed head also. The two dorsal fins are widely separated, the first having only four stiff acute spines. The ventrals are in general placed on the abdomen. The teeth are not always present, but, when so, are so fine as to be almost invisible. The pharyngeals are greatly developed, closing the gullet, so that only soft and thin matters can enter the narrow angular opening of the œsophagus. A considerable number of species are known, natives of the Mediterranean, and the coasts of India and Africa. Several frequent the British seas, the two most common being *Mugil cephalus* and *M. chelo*. *Mugil cephalus* is the gray mullet of the Mediterranean, is rather more than a foot in length, weighs about ten or twelve lbs., and is of a gray colour above, and a silvery-white underneath. The thick-lipped gray mullet, *M. chelo*, is the most common on the British coasts, and differs from the preceding by having very thick fleshy lips, the edges of which are ciliated by numerous teeth which look like hairs. It is a more brilliantly coloured fish, the back being of fine steel-blue, and having six or seven parallel lines along the sides, of a golden-brown on a silver ground. The gray mullets were well known to the ancients, and Pliny has celebrated the great fisheries the Romans possessed in his time on the coast of Languedoc. The light of a fire attracts these fishes, and when the weather is stormy a fire lighted at the bows of the boat attracts them in great numbers. They are said by the fishermen to be extremely wary and intelligent, and frequently escape from their nets by leaping vertically over them, bounding even over the boats. To prevent this the fishermen use a peculiar net made on purpose. Towards the end of spring and beginning of summer they become excited by the necessity of living in fresh water, and then they approach the shores and enter the mouths of rivers in such numbers, that the water through which they are seen, without being clearly distinguished, appears to be bluish. The flesh of the mullet is tender, and of a very pleasant flavour. It was much esteemed by the Romans, who gave very high sums for them, and seem to have been well aware of what is now known, that those are the best which are taken in fresh water. The eggs salted, dried, and compressed, are made into a sort of caviare, much in request in Provence, Corsica, and Italy, and known by the name of "botarcha." Many other species of mullets, natives of India and Africa, are used as food, and much esteemed.

Mullidæ. *The Surmullet family.*—A family of acanthopterygious fishes, more remarkable for their beauty and history than for their number. See MULLUS.

Mullus. *The Surmullet*, or *Red Mullet.*—A genus of acanthopterygious fishes, forming the type of the family *Mullidæ*. The species are of an oblong shape, with a thick body, and have two cirrhi attached to the symphisis of the lower jaw, which appear to act as feelers. They have no swimming bladder. There are only two European species, both common in the Mediterranean, and both inhabitants of the seas of Great Britain. The striped red mullet, *M. surmuletus*, is the most common on our coasts, being abundant on the southern, but rather rare on the eastern

and northern shores. It is of a bright red or vermilion colour on the back and flanks, with three golden lines, and is from twelve to fourteen inches long. It is very common in the Mediterranean and Atlantic Oceans, where it lives upon small crustacea and mollusca. In the beginning of spring the fishes seek deeper water in large shoals, selecting localities near the embouchures of rivers, in order to deposit their spawn. The plain red mullet, *M. barbatus*, is rarer on the coasts of Britain than the preceding, though equally abundant in the Mediterranean, and differs from it chiefly by its colour being of a more uniform deep red, and wanting the golden lines. The red mullets are excellent food, and are amongst the fishes that are the most extolled by the ancients both for beauty and good eating. The Romans especially considered them a great luxury, and spared no expense to procure them for their tables. Such immense prices were given for them as almost to entail ruin on the purchasers; and the satirists of the day asserted that it was not a *fish* that was sent up to supper, but a *man!*—"non est piscis; homo est; hominem, Calliodore, voras." Pliny relates one specimen having been purchased by Asinius Celer for 8,000 sesterces, equal to £64 17s. 10d. of our money; and Suetonius mentions a dish of three red mullets having cost the sum of 30,000 sesterces, or £243 10s. It was one of the luxuries of a giver of feasts to cause these fishes to swim down streams led through the banqueting room, that his guests might enjoy the sight of their brilliant colours during the repast. The streams led under the very couches of the guests, and they were caught under the table that they might be the sooner placed upon it, for they were not considered to be fresh unless they expired in their very hands. Nothing was thought more beautiful than a dying mullet, and they were therefore exposed in vessels of glass, and allowed to die there, that the eyes of the guests might be glutted with the sight of the varied hues of the expiring fish. Its struggles to escape death bring out the most brilliant scarlet tints, which are followed by a general paleness, and these two extreme tints mingle in a most agreeable manner. The liver was considered the most delicious part, and was bruised in wine to make a sauce for the flesh.

Munsteria.—A genus of ammonites. See AMMONITIDÆ.

Murænidæ. *The Eel family.*—A family of apodal malacopterygious fishes, comprising a number of species, having long slender bodies, covered with small scales sunk into a thick slimy skin, no ventral fins, and their gill flaps small, surrounded by the gill rays, and covered with the skin, leaving merely a small tubular opening for the emission of the water. They have been divided into several genera according to their teeth and the proportion of their fins. The true eels belong to the genus *Anguilla*. They possess pectoral fins, and have the dorsal and anal fins long and united. The gills are situated beneath the pectoral fin. Three or four species of eel are found in this country. The sharp-nosed eel, *Anguilla acutirostris*, is the most abundant, and may be distinguished from the others by its comparatively narrow and sharp muzzle. The lips and the lateral lines are furnished with a great number of open glands which constantly secrete an unctuous liquor, causing the skin to appear as if varnished, and to feel exceedingly slippery. The vertebræ are 113 in number. Eels are of slow growth, but live long; some it is said having been known to live upwards of 100 years! They are able to shut closely the opening of the gills and mouth, and thus to keep the gills long moist, in consequence of which these fishes are enabled to live a long time out of water — it is asserted even for six or eight days. They are certainly well known to leave the water and to creep considerable distances on the ground like a serpent. In this way they sally forth at night to hunt for worms, insects, &c., and are said by some observers to be fond of peas! They eat also small fish spawn, dead flesh, &c. Eels are found in streams, lakes, and ponds all over Europe. In the lakes near Venice they abound in thousands, and are found equally numerous in those of Southern Russia and Turkey. During the day they live concealed in the mud, or in large holes excavated in the banks, which will sometimes hold a great many together. Eels are very delicate eating, and are much used in many parts of Europe, but were forbidden to the Jews by the laws of Moses. The London market is supplied principally from Holland by Dutch fishermen. About ten vessels are constantly employed, and each one brings over a cargo of from 15,000 to 20,000 lbs. weight of live eels. The conger eels belong to this genus also, though they have been placed in one by themselves by some naturalists, under the name of *Conger*. The common conger eel, *Anguilla conger* = *Conger vulgaris*, is a marine species, and is found in many of the European seas. It is abundant on the coast of Cornwall, and it is no uncommon thing for a boat with three men to bring on shore from five hundredweight to two tons of this fish, taken during the night. The conger attains a very large size, being frequently five or six feet in length, and occasionally attaining that of ten, of the thickness of a man's thigh, and weighing 100 lbs. The flesh is not much esteemed, though it meets with a ready sale at a low price, amongst the poorer classes. Great numbers are sent from Boulogne almost every day during the time they are in season, to Paris, where they appear to find a steady market. The genus *Muræna* differs from *Anguilla* by having no pectoral fins, and possessing a single row of teeth in each jaw. The Muræne, *Muræna Helena*, is the type of the genus. It is common in the Mediterranean,

and grows to the length of four or five feet, and upwards, and its smooth skin is beautifully marbled with yellow sub-angular markings on a rich brown ground. It has very much the habits of the eel, and, like it, its flesh is considered excellent. It was highly esteemed by the ancients, who kept it alive in vivaria. The Romans were in the habit of introducing these fishes in crystal vases to the table before being cooked, that the guests might admire their variegated skin. Notwithstanding their brightly marked skin, these fishes are repulsive in appearance, and very voracious, and it is recorded that at Rome Vædius Pollio caused his offending slaves to be flung alive into the ponds to feed his murænæ. It possesses the power of living a long time out of water, and its teeth being very numerous and very sharp, it is capable of biting very severely. The genus *Saccopharynx* contains a recently discovered and singular fish. It grows to a large size, and is able to distend its thorax to the size of a large tube. Only a few specimens of this curious fish have as yet been found. They were observed floating in the Atlantic. The family *Murænidæ* is now broken up into three separate families,—1st, *Anguillidæ*, containing the true eels, which have the teeth card-like or villous, lateral gill openings, conspicuous pectoral fins, and the tail encompassed by the union of the dorsal and anal fins. 2d, *Murænidæ*, containing chiefly marine fishes, for the most part of large size, having no pectoral fins, possessing lateral slits for gill openings, and many small teeth, which are sharp, and placed on nearly all the dentiferous bones of the mouth. 3d, *Congeridæ*, containing the conger eels, which possess a dorsal fin, commencing close to the occiput, a naked skin destitute of scales, and for the most part a longish, pointed, projecting snout.

Muricidæ.—A family of gasteropodous *Mollusca*, containing numerous species, the shells of which are characterized by having a straight, tubular, anterior canal. The animals have a more or less elongated straight syphon, a small truncated head, and a broad foot, carrying a horny, annular operculum, and are carnivorous, preying upon other mollusca. The genus *Murex* is the type of the family, and contains about 180 species, which are all marine, and are distributed nearly over the whole world, ranging from low water to twenty-five fathoms. At certain periods of its growth the animal expands the edge of its mantle, and during this time deposits appendages on the edge of the shell for their protection. These expansions of the mantle are then gradually withdrawn, and the portion of the shell which the animal forms between this time and the next development of the appendages, is of the common shape; but the expansions produced for their protection are left on the surface of the shell, forming variously shaped bands across the whirls, which have been called *varices*. The time occupied by the animal in producing this portion of the shell is about a year, and the quantity of shell formed amounts to about a third, or often less, of a whirl. This genus contains many rare and beautiful shells, some of which at one time were of great commercial importance. The famous purple dye of the ancients was in all probability procured from one or two species of murex. The small shells were bruised in mortars, and the animals of the larger were taken out. Heaps of broken shells of *Murex trunculus*, and caldron-shaped holes in the rocks, may still be seen on the Tyrian shore; and on the coast of the Morea there is similar evidence of the employment of *M. brandaris* for the same purpose. About 160 species of murex have been discovered fossil in the eocene beds of Britain, France, &c.

Muridæ. *The Mouse* and *Rat family.*—An extensive family of rodent *Mammalia* belonging to the order *Glires*. The animals belonging to this family have a more or less elongate tail covered with whirls of scales; the fur is soft, with scattered longer hairs, or flat channelled striated spines; the lower cutting teeth are awl-shaped, and the ears and eyes are distinct. The various species belonging to the family are very difficult to arrange; but of late naturalists have divided them into several groups or sub-families: as *Murina* and *Arvicolina*, containing the true mice and rats, the water-rats, campagnols, meadow-mice, and voles, &c. (see MURINA); *Saccomyna*, containing the pouched rats (see HETEROMYS; *Castorina*, containing the beavers (see CASTOR); and *Echimyna* (see MURINA).

Murina.—A sub-family of the family *Muridæ*, containing the mouse, rat, and other allied animals. They are characterized by having separate toes, a wart-like thumb to the fore feet, and tubercular grinders. The genus *Mus* is the type of the family, and contains a number of well known species. The common or domestic mouse, *Mus Musculus*, seems to be entirely dependent on civilized man, and has never been found at a distance from his dwelling; it is found throughout all Europe, and has extended to America and Australia. The wood mouse, *Mus sylvaticus*, is a bitter enemy to the agriculturist, horticulturist, and planter. It is found in fields and gardens, widely diffused throughout Europe. They form large magazines of grain, acorns, nuts, &c., for their winter provision; and the mischief done to the farmer by hogs rooting up the ground is said to be caused by their searching for these subterranean treasures. The harvest mouse, *Mus messorius* (*Micromys minutus*), is the smallest, and one of the prettiest of all quadrupeds that exist in Britain. They build a curious nest amidst the straws of standing corn or in thistles; and, in harvest, are carried into barns with the corn sheaves, where they live and multiply. In winter they retire to burrows or make their rendezvous in corn ricks. These little creatures are about 2¼ inches in length from nose to root of

tail, this latter organ being two inches more. The lineated mouse, *Mus pumilio*, from the Cape of Good Hope, is still smaller, however, than the harvest mouse, and weighs less than four scruples. The black rat, *Mus Rattus*, was at one time the common rat of Great Britain. It appears to have been imported here from the continent about the middle of the sixteenth century. It is still to be found in some parts of the country, but is rapidly disappearing before the brown rat, *Mus decumanus*, or Norway rat, which is a more enterprising and stronger species. This rat never made its appearance in England till about forty years ago; and, most probably, as well as the preceding species, was introduced originally from India, in some parts of which it is still very common. It has now spread over the greater part of Europe, and is equally common in America, where, as in Europe, it has superseded the black rat. The rat is eminently carnivorous, bold and ferocious; and is very destructive in the game preserve and poultry-yard. The Cairo rat, *Acanthomys Cahirinus*, a native of Egypt, is remarkable for having spines on the back instead of hairs, and was noticed by Aristotle. The bandicoot or pig rat, *Mus Bandicota* or *giganteus*, is the largest and most formidable species of the subfamily. In appearance it is like a brown rat dilated to gigantic proportions, as it measures upwards of thirteen inches from the nose to the root of the tail, and has a tail thirteen inches long. A male weighs three pounds. It is com-

1. Bandicoot—*Mus giganteus*. 2. Barbary Mouse—*Mus Barbarus*. 3. Sparman's Mouse—*Mus pumilio*. 4. Black Rat—*Mus Rattus*. 5. Harvest Mouse—*Mus messorius*. 6. Norway Rat—*Mus decumanus*.

mon in many parts of India, and is a most mischievous animal, burrowing to a considerable depth and undermining the foundations of granaries and storehouses. Its chief food is grain and vegetables, and it does much damage to gardens. The lowest caste of Hindoos eat the flesh of this species. The hamster is placed in this group. See CRICETUS. There are some mice in South Africa which live on trees. These constitute the genus *Dendromys*. In the group *Murina* are also placed the rabbit-rats of Australia, *Hapalotis albipes*, *melanura* and *Gouldii*, which, in the shortness of the fore legs compared with the hinder, and the pencil of longer hair at the tip of the tail, approach very nearly the jerboas. The second sub-family of Muridæ, *Arvicolina*, have the crown of the grinders flat as if they were truncated. Many species are described. The genus *Arvicola* may be taken as the type, containing the water-rat, *A. amphibius*, so well known, inhabiting the banks of rivers, ditches, and ponds, in which it burrows and breeds. The campagnol or meadow mouse, *A. arvalis* or *agrestis*, which, though small, commits such destruction in fields, gardens, and woods, destroying young trees, and feeding on roots and seeds. The economic vole, *A. œconomicus*, from Siberia, which inhabits a sort of oven-shaped chamber placed under the turf, from which issue several narrow and ramifying canals running in various directions, communicating with a second chamber wherein it amasses its provisions. The lem-

mings belong to this group. The lemming, *Myodes Norvegicus*, is a native of Norway and Finland, is about five inches long with a tail half an inch, and is of a tawny colour variegated with black. It subsists entirely on vegetable food, and lives in shallow burrows under ground in summer, and makes long passages under the snow in winter. The most remarkable feature in the history of the lemming is, the periodical migrations the animals make from one part of the country to another. They descend in great bands from the mountains which divide Nordland and Finmark, eating up everything before them. They pursue their course in a strait line, climbing walls and houses, and not avoiding man himself should he stand in their way, but attempting to climb over him. Rivers and lakes are swam across, the band forming again on the farther side, and corn and hay-stacks are gnawn through. Like an army of locusts they pass on, leaving a desolate track behind them, nor do they stop till they reach the sea, where thousands are drowned. During their march great numbers are destroyed by hawks, owls, weasels, &c., and so great is the havoc thus committed, and by their being swept away in crossing rivers, &c., that but few ever reach their native haunts again. The cause of these migrations is not well understood, but it is supposed to arise from want of food. They appear to take place at irregular intervals; but, upon an average, about once in ten years. In former times the lemmings were superstitiously believed to fall from the clouds, and, in such dread were they held by the natives, that the priests were wont to exorcise them by bell, book, and candle. Several species of fossil *Murina* have been discovered in the bone caves of Kirkdale, in the bone breccias of Sardinia, &c., and in the tertiary beds. Two or three species of *Arvicola* and two or three of *Mus* have been recorded.

Mus. *The Mouse genus.*—See MURINA.

Musa.—See MUSACEÆ.

Musaceæ.—A nat. ord. of monocotyledonous plants, consisting of a number of species which are generally herbaceous, rarely ligneous, and usually of a large size. These plants have scarcely any true aerial stem, but, instead, have shoots proceeding from subterraneous rootstocks, which form spurious stems composed of the sheathing leaf-stalks. The leaves are flat, and traversed throughout their whole length by a thick median rib, with simple veins running directly towards it from the margin. The species are found in warm and tropical regions, and some are much cultivated on account of their fruit. The genus *Musa* is the type of the family, and is one of the most important of all found in tropical countries. The plantain, *Musa sapientum*, has a fruit which is used to an immense extent by the inhabitants of hot climates, and is, in reality, one of the necessary articles of their food. Throughout equinoctial Asia and America, in tropical Africa, and in the islands of the Atlantic and Pacific Oceans, wherever the mean temperature of the year exceeds 75° (Fahrenheit), the plantain is extensively cultivated. It is often the whole support of an Indian family,

Musa sapientum, var. Sinensis.

as an extent of ground which, in wheat, could only maintain two persons, will yield sustenance under the plantain to fifty. A great many varieties are produced by culture. Besides its utility as an article of food, a tough fibre, capable of being made into thread of great fineness, is obtained from its stem, and the leaves, from their breadth and hardness, form an excellent material for the thatch of cottages. An intoxicating liquor is also made from the fruits when fermented, and the young shoots are eaten as a delicate vegetable. The banana, *Musa paradisaica*, is only a variety of the plantain, the fruit being smaller and more delicate flavoured. Botanists call it *paradisaica*, from an allusion to an old notion of its being the "forbidden fruit of Scripture;" and fanciful writers have supposed it to be the "grapes" brought by the spies of Moses from the promised land, one bunch of which was borne upon a pole by two men. Several other species of the genus *Musa* are known, all natives of Asia, one of which affords a valuable textile fabric. This species, *Musa textilis*, is a native of the Philippine Islands; and from the delicate vegetable fibres is obtained a fine thread called Manilla hemp, from which the fine muslins known as Manilla handkerchiefs and Manilla scarfs are manufactured. Only three other genera belong to the family *Musaceæ*.

Heliconia is the principal American form, and the species are conspicuous for their brilliantly coloured, boat-shaped bracteæ, sometimes yellow, sometimes scarlet, and even a mixture of both. *Strelitzia* is the African form, the species being natives of the Cape of Good Hope, and distinguished by their rigid glaucous leaves, and singularly irregular flowers of a yellow and blue, or white colour. *Urania* is a Madagascar genus, and contains only one species, *U. speciosa*, or the ravenala—it is a noble palm-like plant, and is remarkable for the brilliant blue colour of the lacerated pulpy aril which envelops the seeds; the leaves are arranged in a fan shape, and the seeds are said to constitute a wholesome food—they are also used for dyeing in Madagascar.

Musca. *The Fly genus.*—See MUSCIDÆ.

Musci. *The Mosses.*—See ACROGENÆ.

Muscicapa.—See MUSCICAPIDÆ.

Muscicapidæ (*musca*, a fly; *capeo*, to take or catch). *The Fly-catchers.*—A family of birds belonging to the dentirostral tribe of the order *Passeres*, comprising numerous species characterized by their beak being more or less depressed, broad at the base, with bristles, and the tip suddenly bent and emarginated. Their tarsi are generally short and slender. They are, for the most part, inhabitants of the warmer parts of the world, and feed almost exclusively upon insects. They have been divided into different groups or sub-families according to the structure of their bill and tarsi. The sub-family *Muscicapinæ* contains the true fly-catchers, and they are the only species of the family found in the Old World; their beaks are weak, much depressed, with the tip slightly hooked and emarginated; their gape is always bristled, and their tarsi are short and slender. The genus *Muscicapa* is the type, and gives its name to the whole family. It contains several species, mostly of a small size and with a rather lively coloured plumage. The spotted fly-catcher and the red fly-catcher are summer visitants to this country, and breed here. The spotted fly-catcher, *Muscicapa grisola*, is a native of Africa, and arrives in this country late in May. It has no song to recommend it, but it is most useful in clearing its neighbourhood of gnats and other troublesome insects. Perched on the top of a stake or upper part of a gate-bar it remains motionless till some luckless insect comes in its way, when it pounces upon it in an instant, and immediately returns to its post till another victim comes in its way. The male bird is most assiduous in feeding the female while she sits, and has been observed feeding her as late as nine o'clock at night. The red fly-catcher, *Muscicapa atricapilla*, comes to us from the south of Europe and the countries bordering on the Mediterranean. It is common, in summer, near the lakes of Cumberland and Westmoreland, where it forms a very inartificial nest and lays seven or eight eggs of a uniform pale blue. It has varied and pleasing notes like the redstart, and feeds like the preceding species. One of the most beautiful species of this sub-family is the fan-tailed fly-catcher, *Rhipidura flabellifera*. It is a native of Australia, and is very curious in its habits—it frequents small trees and bushes, from whence it suddenly darts at its prey, spreading out its tail like a fan (hence its English name), and, to appearance, turning over like a tumbler pigeon, and then immediately returning to the same twig or bough from whence it sprung. The sub-family *Alectrurinæ* have the bill of variable length, but it is always somewhat depressed, with the culmen rounded. Their tarsi are lengthened and strong. The species are found only in South America, generally in the vicinity of water, where they pursue insects on the ground; they are also called *Fluvicolinæ* or water-chats; they run with great celerity and are seldom seen perching. The genus *Alectrurus* is the type of this sub-family, which is well marked by the remarkable development of the tail feathers. The sub-family *Tyranninæ*, the tyrants (tyrant shrikes or tyrant fly-catchers), have a long, straight, and strong bill, somewhat depressed throughout, and gradually compressed towards the tip, which is suddenly hooked. Their tarsi are short and slender—they are found in the warmer parts of South America, and are very bold and spirited birds—they are less strictly insectivorous than the others, as one or two of the species have been observed to feed upon small birds, and even plunge into the water after fish, like the king-fisher. The species are numerous in tropical America, and may be seen everywhere perched upon naked branches, uttering, at short intervals, a sharp and monotonous cry. They are very quarrelsome during the season of incubation; the male will not then suffer any birds to come near its nest, and becomes so infuriated against such unconscious intruders that it will attack both hawks and eagles, with a determination not to be resisted, until they are fairly driven away. One species is particularly noted for his boldness and courage upon such occasions, and has obtained for him the name of *Tyrannus intrepidus*, or king-bird. This bird is a native of North America, is said to be very partial to bees, and is believed, by many intelligent people who have watched him near a bee-hive, to pick out the drones and never to injure the working bees. The sub-family *Tityrinæ* have a short very broad bill, compressed toward the tip, with the culmen convex and smooth, their wings are long, and their tarsi short and weak. The species of this sub-family are natives of South America, and may generally be seen perched on the high branches of trees, where they sit waiting to pounce upon any insects which approach within reach. The genus *Tityra* or *Psaris* is the type, and the best known species is the Cayenne shrike, *T. Cayana*, a native of Cayenne. The last sub-family, *Vireoninæ*, or fly-catching warblers, have short, very compressed beaks, with the tip hooked, and the gape with bristles. They are

only found in America, and feed on fruits as well as insects. See ICTERIA.

Muscicapinæ.—A sub-family of fly-catchers. See MUSCICAPIDÆ.

Muscidæ. *The Fly family.*—A family of insects belonging to the order *Diptera*, and containing those insects peculiarly known by the name of flies. The species of this family are distinguished from the others of the group *Athericera*, to which they belong, by their having the proboscis distinct, short, thick, membranaceous, terminated by two large labial lobes, and entirely retractile within the oral cavity, enclosing only two internal setiform organs, and a pair of palpi. The antennæ are triarticulate, the body is generally short and robust, and the legs and wings of moderate length. The genus *Musca* is the type, and originally the whole of the known species were contained in this one genus alone. Since the time of Linnæus, however, the new species have so increased in number that it has now become the type merely of a large and numerous family. Some idea of the extent of the family may be formed from the fact of 700 or 800 species having been recorded in England alone, and as the study of this family has not been so much attended to as many others, this probably is not more than one-third of the number of indigenous species. The species are found scattered in the greatest profusion all over the globe. They are found wherever plants grow, seeking their food in the corollæ of flowers, and their larvæ are formed for the destruction of decomposing matters. Their eggs are deposited upon any dead or putrescent substances, either animal or vegetable, and the larvæ when hatched serve an important purpose in removing putrid matter. The genus *Musca* is at present restricted to a few species, some of which are well known. The common house fly, *Musca domestica*, affords the most familiar example. This species is exceedingly abundant during the whole summer, and especially in the months of July and August. They are teasing, troublesome insects, annoying from their numbers and perseverance in buzzing about our dwellings. The structure of the foot of the fly has given rise to a good deal of discussion. It is well known that the house fly is able to walk in all positions upon the smoothest and most polished surfaces. This faculty has been asserted by some to depend upon an apparatus which causes the foot to produce a vacuum and thus enables it to take a strong hold upon objects possessing a smooth surface. Others, however, maintain that this is incompatible with the structure of the foot, which has the inferior surface covered with minute hairs closely set and directed downwards. They believe that it is by means of those hairs that the insects are enabled mechanically to retain their position, as when examined by a microscope, the most smooth and polished substances, glass itself, are seen to have a certain roughness on their surface. A third opinion, however, has been held by other observers. They conjecture that these hairs contain a glutinous secretion by which the fly can adhere to glass or other smooth surfaces and that they can, when vigorous, press out this secretion. The flesh fly is now removed to the genus *Sarcophaga;* the blue bottle to the genus *Lucilia;* and the meat fly to that of *Calliphora*. The eggs of these insects are well known by the name of "fly blows," and are deposited upon meat and other animal matter. The larvæ are soon hatched, and when the period of transformation is arrived, they descend into the ground where they assume the pupa state. These larvæ are known to those who "ply the gentle craft," as *gentles*.

Musophagidæ (*musa*, the plantain; *φαγω* to eat). *The Plantain-eaters.*—A family of birds belonging to the conirostral tribe of the order *Passeres*. The species are distinguished by having short largely elevated and gibbose bills with the margin generally serrated. The wings are more or less lengthened and rounded, and the feet are short and formed for clinging. The genus *Musophaga* may be considered the type of the family. The species are distinguished by their outer toe being versatile. They are natives of Africa, and feed upon fruits. *M. violacea* is a magnificent bird. The bill, very much dilated at the base, is of a rich yellow colour passing into crimson, the naked orbits and the compact velvety feathers of the crown are of a glossy crimson, while a stripe of white extends from below the eye to the ear. The general colour of the plumage is violet, with the secondary and part of the primary quills carmine, and the tail deep green. It is a native of the Gold Coast and Senegal. The touraco, *Turacus Senegalensis* is also a handsome bird. Its prevailing colour is green, varied with purple on the wings and tail. It perches on the highest branches of forest trees, and keeping out of gunshot, is consequently difficult to be obtained. It is found at the Cape of Good Hope. The colies, *Colius*, which belong to this family, have a very long and pointed tail, the tarsi scutellated, and the four toes all placed forward. Their plumage is soft and silky, and the colours sombre; hence they are called at the Cape, where they are found, "mouse birds." They are gregarious birds, living in flocks, feeding on fruits, and proving great scourges to gardens. They build their nests in groups, and when they take their rest, they sleep in companies, suspended to the branches by one foot their head downwards. Their flesh is said to be delicate.

Mustela. *The Weasel.*—See MUSTELIDÆ.

Mustelidæ. *The Weasel tribe.*—A family of carnivorous animals belonging to the order *Feræ*. The animals belonging to this family are generally speaking, small, with an elongated slender body, very short legs, short round ears, and a lengthened more or less depressed head. They have only a single tubercular grinder in

each jaw, the upper one being oblong, transverse, and bluntly tubercular. They are very agile creatures, and are amongst the most sanguinary and rapacious of all the carnivora, feeding entirely upon living prey, unless very hard pressed by hunger. Though small they are extremely bold, and do not hesitate to attack animals ten times larger than themselves. They employ great cunning and address in order to seize upon their victims, which they do at unawares, but at the same time if needs be they show great courage in the attack or in self-defence. The more typical species of the family are the martens, weasels, and polecats, but it contains also a good many others, as the otters (see LUTRA); the glutton and grison (see GULO); and the badgers (see MELES). The martens, *Martes*, may be taken as the type of the family. The pine marten, *Martes abietum*, is common in various parts of Europe and North America. It is about one and a-half foot long from the snout to the tail, this latter organ being ten inches more. Its colour is a lustrous brown, with a clear yellow spot under the throat. They live in the depths of the densest woods and forests, and climb trees with great agility in search of birds and small mammalia. They are particularly destructive to small game and the eggs of birds. Their life is one of rapine, prowling about trying to surprise the partridge in its cover, the hare on its form, or the squirrel in its nest. Failing these they seize upon field mice, dormice, and other small animals of that kind, and will even destroy lizards and serpents. They are also said to attack the nests of wild bees for the sake of the honey. When the female is about to bring forth her young, she seeks out a squirrel's nest, and having destroyed or driven away the proprietor, takes possession of it for herself, enlarging it as necessary, and making it comfortable. When the young are able to walk about, they all leave their nest, and sally forth, sleeping afterwards in the hollow trunks of trees, or rolled up amongst dry leaves. The skin of this little animal is much used by furriers, and immense numbers are brought to this country from North America, the fur of those being better than the European ones. Upwards of 100,000 skins are annually imported into Great Britain. The beech marten, *Martes Foina*, is considered by some merely a variety of the preceding. It has a white mark under the throat, and is found nearer the habitations of men than the pine marten, but its habits are the same. Both these species of marten are found in England. The sable, *Martes zibellina*, is a native of the northern parts of Europe and Asia, and is very much prized for its skin. It is considered by many authors as only another variety of the pine marten, but what is rather curious a perfect specimen of this animal is a desideratum in our collections. The fur of the sable is brownish in summer and black in winter. This winter coat is by far the most precious, and forms an article of great commerce with the Russians. The most valuable come from Siberia. Indeed it is to the chace of this animal that the discovery of the eastern countries of Siberia is ascribed. The polecats, *Putorius*, differ from the martens in their teeth, and exhale a very disagreeable smell. The common polecat, *Putorius fœtidus*, is rather more than a foot in length, exclusive of the tail, which is six inches more. It is of a dark brown colour, and is a very common animal throughout the greater part of Europe. It resembles the marten a good deal in its habits and manners, but it is more of a nocturnal animal, sleeping during the day and sallying forth at night to seek its prey. It generally inhabits places in the neighbourhood of man, frequently taking up its abode in old barns and outhouses, and committing great havoc in henroosts and dovecots. When it lives in the fields, it is not far from a farm, or in the heart of a preserve that it has its head-quarters. The polecat, weasel, and marten, from their elongated bodies are generally described as *vermiform*, and hence our English word *vermin*, which is applied to them all. None of these *vermin* are more destructive to game than the polecat, and none is more relentlessly punished by the gamekeeper. The female generally takes possession of a rabbit burrow for her nest after having eaten or driven away its original occupiers. The odour which this animal exhales is very offensive, and seems to have given the names by which in many countries it is known. *Foumart*, the name by which it is called in England and Scotland, appears to be a corruption of *Foulmart*. In Welsh, *Ffwlbard*; in French, *Putois*; in Italian, *Fœtta* and *Puzzolo*; and in Spanish, *Putoro*, all seem to point to the same origin. The mink, or minx of the fur traders, *Putorius* (*Vison*) *Lutreola*, is a native of the north of Europe and America, living on the banks of rivers and ponds, and feeding upon frogs, cray fishes, and fishes which it pursues in the water. It exhales a strong odour of musk, and its fur is in considerable request. The weasels are peculiarly *vermiform* in their appearance. The common weasel, *Mustela vulgaris*, is a well known animal. It is about six inches long, with a tail two inches more; and is found throughout all the temperate parts of Europe. In general it is found inhabiting places near the habitation of man. It is an exceedingly agile little creature, and its quick eye and easy gait give it a remarkable degree of effrontery as it looks at an intruder when it feels itself out of danger. It bounds along with great speed, and is able to leap five or six feet high when it makes for a tree, from branch to branch of which it springs with the agility of a squirrel. It lives upon small animals, as moles, rats, field mice, birds, &c. It is bold and courageous, and will attack an animal twice the size of itself, and seldom fails to kill it. The weasel is considered by many good authorities to be of great service to the farmer by destroying

mice which are so mischievous by their numbers in corn ricks and granaries. The ermine, *Mustela erminea*, is a much more destructive animal, destroying game to a considerable extent. Its fur, however, is valuable, and is an object of

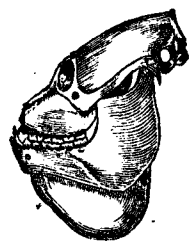
Mustela vulgaris—The Weasel.

considerable commerce. It is upwards of nine and a-half inches long, exclusive of the tail, which measures three and a-half inches more. In winter the fur becomes quite white, except the tip of the tail, which always remains black. It is a native of northern countries, and though not uncommon in Scotland, is more especially abundant in Russia, Siberia, Kamtschatka, North America, Lapland, and Norway. Its habits are much the same as the generality of the family. In summer the fur of this little creature becomes of a fine chestnut colour, and at this season the furriers know it by the name of *Roselet*. When it becomes white in winter, it is the *Ermine*. In 1850, 187,000 skins were imported into this country. The ferret, *Putorius Furo*, is a native originally of Africa, but is now domesticated with us, and indeed, by many is considered only a domesticated variety of the polecat. It is quite white and has red eyes, depending perhaps upon its having been domesticated for a great length of time, and is even more bloodthirsty than the polecat or marten themselves. Ferrets are kept for the purpose of hunting rabbits, and it appears that the ancients knew them well and used them for the same purpose as we do at the present day. The zorille or Cape polecat, *Zorilla Striata*, is also a native of Africa, being found at the Cape of Good Hope, where it is called the "muis-hond." It is about a foot long, exclusive of the tail, which is eight inches more. It has much the same habits as the martens, only it does not climb trees, but makes a burrow which it inhabits during the day, and to which it retires at the least appearance of danger. The skunks, *Mephites*, belong to this family, and in some respects approach to the badgers. They have the anterior claws long and adapted for digging, and are distinguished beyond all the rest of the family by the powerful and disgusting stench they possess. The odour is that of the polecat, mingled with an overpowering smell of garlic, than which nothing can be more intolerable. In France they are called "bêtes puantes" and "enfans de diable." One of the best described species is the Hudson's Bay skunk, *Mephitis Americana, var. Hudsonica*. This animal is a native of North America, and has the power when attacked by dogs, of emitting such a fetid odour as to drive them off. It hides in hollow trees and rocks, and feeds on insects and wild fruit. Though gifted with such a powerful stench, the Indians eat its flesh and esteem it a great dainty.

Mutilla.—See MUTILLIDÆ.

Mutillidæ.—A family of hymenopterous insects belonging to the group *Fossores*, and characterized by their having thick filiform antennæ. They are solitary insects, and consist of only males and females, the former possessing wings, whilst the latter are apterous. Little is known of the habits of these insects except that in many respects they approximate the sand wasps, being generally found in hot sandy situations. They are met with in all parts of the globe, though principally in warm climates. The genus *Mutilla* is the type, and gives its name to the family. The females possess a powerful sting, and the North American species, *M. coccinea*, has been known to sting a person so severely as to cause him to lose his senses in five minutes, and to be subsequently so ill that his life was despaired of.

Mya.—A genus of bivalve shells. See MYIDÆ.



Skull of *Mycetes ursinus*, to show the structure of lower jaw and organ from whence the howling noise proceeds.

Mycetes (*μυκητης*, a howling).—*The Howlers.*—A genus of quadrumanous animals be-

longing to the family *Cebidæ*, and comprising a number of species, the largest of the American monkeys. They are remarkable for the great development of the organ of voice, which consists of a peculiar kind of bony drum, formed by a convexity of the os hyoides, and communicating with the larynx. The noise produced by these howlers in the dead of night is described as being perfectly apalling, and lasts from about eleven o'clock at night till daybreak. An ear-witness says, a person might suppose that half the wild beasts of the forest were collected for the work of carnage—now it is the tremendous roar of the jaguar as he springs on his prey—now it changes to his deep-toned growlings as he is pressed on all sides by superior force—and now you hear his last dying moan beneath a mortal wound. They are social animals, and live in troops in the deep forests of tropical America. The araguato, or brown howler, *M. ursinus*, is

Mycetes ursinus—Brown Howler.

one of the most abundant, living in Guiana and Brazil. They are gregarious, and forty individuals may be seen on one tree.

Mycetologia (*μυκης*, mushroom; *λογος*, discourse); synonymous with MYOLOGIA, which see.

Mydaus (*μυδος*, bad smell).—A genus of carnivorous animals belonging to the order *Feræ*, and family *Mustelidæ*. It was formed for the purpose of receiving an animal which at one time was described as a species of *Mephitis*. This creature, *Mydaus meliceps*, is a native of Java, and is remarkable for being exclusively confined to those mountains which have an elevation of more than 7,000 feet above the level of the sea. It is about one foot two and a-half inches in length, from the tip of the nose to the root of the tail. Though about the size of the polecat, it is different in general appearance, being more like a hog in shape of body. The tail is scarcely half an inch long, the limbs are short and stout, and the feet are plantigrade. It makes a shallow burrow, is a nocturnal animal, and lives upon insects and worms. It possesses the strong fetid odour of the skunk.

Mygale.—A genus of spiders—see ARANEIDÆ; also, a genus of mammalia—see SOREX.

Myginda.—A genus of plants named after Von Mygind, a German botanist. See AQUIFOLIACEÆ.

Myidæ.—A family of bivalve *Mollusca*, comprising a number of species incompletely covered with their shell, which is gaping at both extremities, and covered with a coriaceous epidermis. The left valve has a large compressed cardinal tooth, whilst the right has a corresponding pit to receive it. They live in soft bottoms, especially the sandy and gravelly mud of river mouths, and range from low water to 25 or even 100 fathoms. About ten species only are known, two or three of which are natives of Great Britain. *M. arenaria* and *M. truncata* are found throughout the northern and arctic seas, and are eaten in Zetland and North America, where they are reckoned excellent articles of food. Several species are found fossil in the myocene deposits.

Mylabris.—A genus of beetles. See CANTHARIDÆ.

Myliobatis. *The Eagle Ray.*—See RAIIDÆ.

Mylittus.—A genus of acotyledonous plants. See THALLOGENÆ.

Mylodon.—A genus of extinct fossil edentate animals. See MEGATHERIUM.

Myodes. The lemming.—See MURINA.

Myologia.—That branch of botany which treats peculiarly of the structure, uses, and arrangement of the mushrooms, or *Fungi*. This is a part of the study of botany which has of late years made great advances, and to which much attention has been paid.

Myopotamus.—A genus of rodent mammalia belonging to the order *Glires*, family *Muridæ*, and sub-family *Castorina*, the beaver tribe. The coypou, *M. Bonariensis*, or *M. Coypus*, is a native of South America, and is rather less than the beaver, which it resembles in many respects, though the tail is long, round, and hairy. The fur is of two kinds, one formed of long ruddy hair, which gives the tone of colour to the animal, and the other brownish-ash coloured, lying at the base of the former. It is this latter fur which is most valuable, and gives to this animal a considerable degree of commercial importance. The fur is called *Nutria*, or *Neutria*, and is imported to Europe for the purpose of making hats. Some years ago large numbers of skins were annually brought to this country. In 1823 1,570,103 skins were imported, but in 1831 and 1832 they did not average more than 358,280 skins. They are extensively used on the continent, and in some years a single French furrier in Paris used to receive from 15,000 to 20,000 skins.

Myosotis (*μυς*, mouse; *ους*, ear). *Mouse Ear*,

Scorpion Grass, or *Forget-me-Not*.—A genus of dicotyledonous plants belonging to the nat. ord. *Boraginaceæ*, comprising about fifty species of herbs, generally of small growth, and almost all natives of the Old World, a few only being found in North America. *M. palustris* is a beautiful plant, inhabiting most places throughout all Europe, and is found also in the Caucasus and on the Altai mountains. This species is generally considered the true "forget-me-not." Eight species are described as British.

Myoxus. *The Dormouse.*—A genus of rodent animals belonging to the order *Glires*, and placed by some authors in the family *Sciuridæ*, and by others in that of *Jerboidæ*. The species have four grinders in each jaw, the front thumb wart-like, and are peculiar in the order to which they belong for having no cœcum. *M. avellanarius*, the dormouse, was known to the ancients, and is found all over Europe. It is not uncommon in many parts of England, and is found in dense thickets, bushy dells, and tangled hedgerows. It lives on acorns, beech mast, corn, young hazel nuts, &c. It makes a very comfortable nest, and providently lays up in it a store of provisions. As winter comes on it becomes very fat, and as the cold weather sets in it retires to its nest, and coiling itself up in a ball, with the tail over the head and back, becomes completely torpid. A warm day will revive it, when it takes some of the food it had stored up, and again relapses into its former slumber, dozing in this manner till returning spring recalls it once more to its active life.

Myrapetra.—A genus of social wasps; the honey wasps. See VESPIDÆ.

Myriapoda (*μυρίοι*, innumerable; *πους*, foot).—A class of invertebrate animals, containing many species characterized by their body being composed of numerous segments, each of which possesses a nervous ganglion, and generally one, or sometimes two pairs of jointed feet. The abdomen and thorax are not distinct from each other, and they are destitute of wings. They have two antennæ, and a mouth composed of several pairs of appendages. The circulation is what is termed incomplete, and their respiration is carried on by trachee. The segments of the body vary very much in shape, some being cylindrical, and others flat and depressed. Some of the species have numerous eyes, while others have only a few. They are all terrestrial animals, and they are either oviparous or ovoviviparous. Some of them are frugivorous, while others are carnivorous; and some, as the *Scolopendræ*, possess a special gland from which exudes a very irritating humour, which, when injected by them into a wound, causes great pain and suffering. The greater number are nocturnal animals, passing the day under moist moss, or under the ground, and crawling forth at night to search for their food, which consists of insects, &c. There are several species which are phosphorescent in the dark. They are very tenacious of life, and even when much mutilated, live for many days. The *Myriapoda* have been arranged in two large groups or orders. I. *Chilognatha*, in which the body is rounded, and the segments are numerous. These segments are unequal, and the feet are fixed to the ventral surface. In the genus *Julis* there are two pairs of thread-like legs to each segment, and in some of the species they amount to the number of 160 pairs. To this order belong the genera *Glomeris*, *Polyxenus*, *Polydesmus*, *Julis*, &c. II. *Chilopoda*, in which the head is broad and prominent, and the segment unequal, each carrying only one pair of well developed legs. To this order belong the genera *Lithobius*, *Scolopendra*, *Geophilus*, &c.

Myrica. *The Gale.*—See MYRICEÆ.

Myricæ.—A sub-family of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, and containing about twenty species, which are natives of both temperate and tropical climates, being found in North and South America, in India, and at the Cape of Good Hope. The genus *Myrica* consists of only a few species which are shrubs or small trees, and abound in resinous and oily matters. One of the species, *M. gale*, sweet gale, Dutch or Scotch myrtle, is a native of Great Britain, and is very common in boggy places. It is found in many other parts of Europe, and also in North America, and is a bushy plant, about four feet high, with a shrubby stem. Its leaves and branches are covered with small punctulations, and yield, on distillation, a yellow etherial oil of a feeble odour and mild taste. When bruised the leaves are fragrant, and in consequence are very often used in country places to put amongst clothes to preserve them from moths, and we have also seen them placed under mattresses of beds to deter fleas. *M. cerifera*, the wax myrtle, is a larger species than the preceding, and is abundant in many parts of the United States of America, especially Virginia, Louisiana, and Carolina. The berries are remarkable for the quantity of wax they contain. This is collected by throwing them into boiling water, when the wax separates and floats on the surface. This wax is used for making candles, which burn slowly and give a fragrant odour. The bark of the root is astringent, and has been used as such by medical men in America.

Myripristis.—A genus of acanthopterygious fishes belonging to the family *Percidæ*, and remarkable for the numerous spines which roughen the cheeks, the opercula, and the edges of the scales. One of the species, *M. Jacobus*, commonly called "frère jacques," a native of the West Indian Seas, is a beautiful fish, equalling in brilliancy the gold fish, and is from ten to fifteen inches long.

Myristica. *The Nutmeg genus.*—See MYRISTICACEÆ.

Myristicaceæ.—A nat. ord. of dicotyledonous plants, containing about thirty-five species of

tropical fragrant aromatic shrubs and trees. The genus *Myristica* is the type of the order, and the most important one contained in it. The species of this genus resemble in general appearance the laurels. The leaves are alternate and entire, and the flowers are by no means showy. The fruit, however, of several species is highly aromatic. The common nutmeg, *M. officinalis*, is the most valuable in this respect. It grows to the height of from thirty-five to forty feet, and the branches being divaricated in their growth, thick, and much branched, form a handsome cyme at the top. The trunk and leaves abound in a reddish juice, which flows out upon being cut, and coagulates on exposure to the air into a substance like dark blood. The fruit is about the size of a small peach, fleshy and smooth externally, and of a greenish colour, turning yellow when ripe, and splitting into two halves. It encloses a kernel which is partly covered by an arillus of a red fleshy substance, which forms an incomplete network round it. The kernel is the *Nutmeg*, and the red arillus is the *Mace*. Both the kernel and the mace are highly aromatic, and are too well known to need description. Originally the nutmeg tree was only found growing in the Moluccas, but it has now been carried to different parts, as Java and Sumatra, and latterly to the West India Islands, though they flourish nowhere so well as in the native country of the tree. The island of Banda is the principal place where the nutmeg flourishes, and it is calculated that about 600,000 lbs. of nutmegs are anually produced, and 150,000 lbs. of mace. About 250,000 lbs. are annually imported into Europe. Nutmegs contain two distinct kinds of oil. One of these is of the consistency of lard, of a yellow colour and agreeable smell, is procured by expression, and is called *Adeps myristicæ*, or (though erroneously) oil of mace. The other is a volatile oil, procured by distillation in small quantity, and is known in commerce by the name of oil of nutmeg. Mace and nutmeg are much used in Europe as agreeable, exciting stimulants and condiments, and in India as a medicine.

Myrmecophaga (μυρμηξ, ant; φαγω, to eat). *The Ant-eaters.*—A genus of mammalia belonging to the edentate animals, order *Ungulata*, family *Dasypidæ*, and sub-family *Myrmecophagina*. The ant-eaters have no grinders, have the body covered with rather long hair, an elongated slender head, with very long exsertile tongue, and walk on the sides of their feet with the claws incurved. The great ant-eater, *M. jubata*, is a native of Brazil and Guiana, and is much the largest of all the ant-eaters. It is covered with long coarse shaggy hair, and has a remarkably large tail, with which, when at repose, it can wrap itself up so as to be effectually protected from heat or rain. It is a powerful animal, and specimens often occur which measure more than eight feet in length from the extremity of the nose to the end of the tail. The second and third toes of the fore feet are provided with long, sharp, pointed, and trenchant claws, so strong that nothing upon which it has an opportunity of fastening can escape, and it is even asserted that it has killed a tiger by plunging these formidable

Myrmecophaga jubata—Great Ant-eater.

weapons into its side and tearing it open. It lives, however, exclusively on ants, and it procures these insects in abundance by tearing open their hills with its hooked claws, and then drawing its long tongue, which is covered with glutinous saliva, over the swarms which flock from all quarters to defend their dwelling. The tamandua, *Tamandua tetradactyla* (*Myrmecophaga Tamandua*), is a smaller species, being about the size of a cat, and differs from the great ant-eater in having short, shining, and somewhat silky hair, and a prehensile tail. It lives in trees, and feeds on ants, bees, and honey.

Myrmeleon (μυρμος, ant; *leo*, lion). *The Ant Lion.*—A genus of neuropterous insects, one of the species of which has long been known for the remarkable habit its larva has of forming a pitfall to catch its prey. This insect, *M. formicaleo*, in its perfect state resembles a small dragonfly. It deposits its eggs in dry sandy places, and as soon as the larvæ are hatched, they begin to prepare their traps for securing food for themselves. For this purpose they insinuate themselves into and beneath the sand, and scoop out a conical pit, at the bottom of which they take up their abode. Should an unfortunate insect tumble into this pit, it is immediately seized, the fluids of the body sucked out, and the carcase jerked out of the hole. Should the insect escape the first attack and attempt with all haste to clamber up the sides of the pitfall, the ant lion immediately throws up a shower of sand and brings its victim down again. The larva continues in this state for about two years, when, being full grown, it spins a cocoon and assumes the chrysalis form, and at the end of three weeks comes out a perfect insect.

Myrmica.—A genus of hymenopterous insects belonging to the family *Formicidæ*, or ants. The genus contains a number of species that

formerly were contained in the genus *Formica*. *M. rubra* is one of our most common British ants.

Myrospermum (*μυρον*, perfume; *σπερμα*, seed.)—A genus of plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, composed of trees and shrubs, growing in the warm parts of America, and yielding balsamic products. The leaves are dotted, and the white, or rosy flowers, grow in axillary bunches. The legume contains only one or two seeds, which are surrounded with a pulpy balsamic matter. The balsam of Peru tree, *M. Peruiferum*, grows to the size of a considerable tree, and is found in Peru, New Granada, and Colombia. Its trunk and large branches give out, when incised, a viscous substance of a pale yellow colour, which soon concretes upon exposure to the air, and forms what is known in commerce by the name of balsam of Peru. This substance contains a quantity of benzoic acid, which gives it the peculiar balsamic odour it possesses. The balsam of Peru has been much used in medicine, as it possesses stimulating properties; but it is much less used now in Europe than the balsam of Tolu, which is obtained in the same way from the species called *M. Toluiferum*. The balsam of Tolu tree is a very handsome large tree, and its wood, which is red in the centre, has an odour of balsam, or rather of rose. It abounds in the high savannahs of Tolu, near Corozol, and on the banks of the river Magdalena. Its odour is very sweet, and its taste warm and sweetish, leaving behind it a slight degree of bitterness. It is a good deal used in medicine for coughs, &c., and is also much employed by the perfumers.

Myrtaceæ. *The Myrtle family*.—A nat. ord. of dicotyledonous plants comprising a large number of species which are shrubs and trees, some of them even attaining a gigantic size. Their leaves are rigid, sometimes even thick, semi-cylindrical, and generally dotted all over with small translucent punctations, which are in reality little glandular reservoirs containing an essential oil. The flowers are regular, and of a white, purple, or red colour, never blue. The species are so numerous, and present such variations in their organization, that they have been arranged in several sub-orders. The *Chamælaucæ*, or fringe myrtles, are heath-like plants, and are natives of New Holland. The *Leptospermeæ* are most of them natives of Australia also, and consist of shrubs and lofty trees—see LEPTOSPERMUM, MELALEUCA, METROSIDEROS, and EUCALYPTUS. The *Barringtonieæ* consist of trees which grow in Asia and tropical America. The *Lecythideæ* are natives of America, and their leaves are not punctate—see LECYTHIS and BERTHOLLETIA. The *Myrteæ* are trees or shrubs which grow for the most part in intertropical countries—see CARYOPHYLLUS, EUGENIA, JAMBOSA. The genus *Myrtus* is, however, the type of the family, and gives its name to the whole order. When first established this genus contained a large number of species, but it has of late been much curtailed. As it now stands it contains about fifty-five species. These are trees, or shrubs, inhabiting tropical America, South Asia, the south of Europe, and some of the islands of the temperate southern hemisphere. The flowers are generally white, rarely purple, and borne upon axillary peduncles which are one-flowered. The fruit is a black or red berry, containing several seeds. The best known species is the common myrtle, *Myrtus communis*, an elegant shrub which grows abundantly throughout the basin of the Mediterranean. Its beautiful foliage and elegant appearance have made it a favourite plant in all ages. The ancient poets made it the symbol of pleasure, and consecrated it to Venus. Groves of myrtle surrounded her temples, and crowns of myrtle leaves were decreed to the conquerors in the games of Greece. The perfume of this plant was likewise held in great esteem by the Greeks and Romans. They used its branches and fruits to perfume their wine, the leaves were employed to put into their baths, and the fruit was used to give an aroma to their food. Their physicians employed it as a medicine. In the present day, however, the myrtle is only used as an ornament to our gardens. At one time a distilled water was procured from the leaves, which was held in high repute on the continent, and in France was known by the name of "eau d'ange." *Myrtus Ugni* is a shrub indigenous to Chili, and is called by the natives *Ugni*, or *Murtilla*. It possesses a strong odour of musk, and its fruit is used in Chili for making a liquor which is said to be equal to the best Muscat wines.

Myrtus. *The Myrtle*.—See MYRTACEÆ.

Mysis.—A genus of *Crustacea*. See STOMAPODA.

Mytilidæ. *The Mussel family*.—A family of bivalve mollusca containing the genera *Mytilus*, *Modiola*, *Lithodomus*, and some others. The shells are ovate-triangular, with a marginal cartilage, and sometimes one or two individual teeth under the umbo. The animals are marine, or fluviatile, and attached to rocks, stones, &c., by a byssus, or beard of stout fibres. The umbos of the shell in *Mytilus* are acute, and placed at the anterior margin of the shell, while those of *Modiola* are placed rather behind the extremity. The common mussel, *Mytilus edulis*, is an abundant species in this country as well as on the coasts of the Mediterranean, and in the North Sea. They frequent mud banks which are uncovered at low water, and form a not inconsiderable part of the food of the lower orders in Britain and France. The consumption of mussels in Edinburgh and Leith is estimated at 400 bushels annually, and immense quantities are also used for bait by fishermen. About fifty species have been described, distributed over all the world. The horse mussels, *Modiola*, are distinguished from the common mussels by their habit of burrowing, or spinning a nest of sand

and shell fragments. The date shells, *Lithodomus*, are highly nutritious and well flavoured, and are remarkable for the power they have of perforating the hardest rocks—see LITHODOMUS. Many species of this family occur in a fossil state, belonging to the permian group and the lias.

Mytilus. *The Mussel.*—See MYTILIDÆ.

Myxine.—A genus of malacopterygious fishes belonging to the family *Petromyzidæ*, and containing only two species, one of which, *M. glutinosa*, or glutinous hag, is not uncommon in the North Sea, and off the north-east coast of Britain. It is shaped like an eel, and when full grown measures about a foot and a-half in length. It is troublesome to fishermen, as it enters the mouths of fishes caught in their lines, and eats up all the fleshy parts of their bodies, leaving only the skin and bones.

Myzantha.—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, and family *Meliphagidæ*. Two species are Australian birds. One, the garrulous honey-eater, or the miner, *M. garrula*, is remarkable for the restless habits it exhibits when any person comes near its haunts. As soon as the intruder is discovered, these birds assemble round him in great numbers, and try to drive him away by the most grotesque actions and an incessant babbling. By this means they become very annoying to the hunter, awaking as they do the suspicions of other animals of which he may be in pursuit. The other species is called the Australian bell-bird, *M. melanophrys*, from its peculiar note, which resembles the distant sound of sheep bells. When this is repeated by a hundred birds all together, the effect is said to be very singular.

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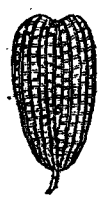
Nacrite.—A mineral of a pearly-gray colour, occurring in small granular masses, which when moistened and rubbed between the fingers, adheres in the form of a nacreous powder. It consists of silica, alumina, protoxide of iron, and water, and has a specific gravity of from 2·788 to 2·793. It is found in mica slate at Brunswick in Maine, and at Wicklow, Ireland.

Naiadaceæ. *The Pondweed family.*—A nat. ord. of monocotyledonous plants which are also known by the name of *Fluviales* and *Potameæ*. The species are aquatic plants, living in fresh and salt water, having cellular leaves with parallel veins, and inconspicuous flowers. Their stem is nodose, and generally creeping. They are found in various parts of the world, but are destitute of any properties of importance. The genus *Naias*, which gives its name to the family, contains several species, which grow in the ponds of Central Europe, and are only used as manure. The genus *Potamogeton* possesses several species, natives of Great Britain, and the rhizome of one, *P. natans*, is used in Siberia by the natives as an article of food. *Zostera marina*, or sea wrack,



Ouvirandra fenestralis.

which occurs in estuaries of the sea, is in some places collected in large quantities and dried. In this state it is used for stuffing mattresses, and as been recommended for hospitals. *Ouvirandra fenestralis* has peculiar skeleton-like leaves, being composed of vascular tissue, without intervening cellular tissue.

Naiades.—A synonyme of UNIONIDÆ or fresh water mussels.

Nais.—A genus of animals belonging to the great group *Vermes*, class *Annelida*, and order *Chætopoda*, and forming the type of a small family. The worms composing this genus are characterized by their body being more or less elongated, filiform, and jointed; each joint being provided with a pair of setaceous appendages, simple or fasciculated. The naides live almost constantly in fresh water, in streams or ponds, and take up their abode in holes which they form in the mud, and from which they are constantly protruding their bodies. Their food consists of small animalcules which they swallow entire. They are oviparous, their eggs being contained in an oval capsule somewhat like the cocoon of certain leeches. They are said to be able to multiply by division of their bodies, each portion into which it might be cut forming a separate independent animal.

Naja.—A genus of serpents belonging to the order *Ophidia* and family *Colubridæ*. Two species, both venomous, and both well known by name, belong to this genus, the aspic of antiquity, and the cobra di capello. *Naja haje*, the aspic, is a native of Egypt, and was of old reckoned by the Egyptians as sacred. It was considered by them as the emblem of the Divinity. The bite of this snake is very dangerous, and the ancients asserted that it caused no pain, but produced a lethargic sleep; and that the wound was so small that it could not be observed. When the aspic is provoked it swells out its neck, draws back its head, and springs at a single bound. The Egyptian jugglers use it as one of their charmed snakes; and it is stated that by pressing the nape of the neck with their fingers they can throw it into a state of catalepsy, causing it to assume the rigid

form of a rod, as might have been done by the magicians in the time of Moses. The spectacled snake, or cobra de capello, *Naja tripudians*, is a native of India, on the Coromandel coast and else-

Indian with Snakes.

where, and is held in such great repute there that it is often worshipped in the temples. The bite of this serpent is very dangerous, unless promptly attended to. It is one of the snakes used by the Indian jugglers. They appear to be partial to music, and easily rendered tame, though no doubt their poison fangs are extracted previously to their being handled. When tranquil and at ease, the diameter of their head and body is about equal, but when irritated or menaced by danger it swells out its neck in the shape of a hood marked with a dark streak resembling a pair of spectacles.

Naphtha. *Petroleum*, or *Mineral Oil.*—A limpid or yellowish fluid, lighter than water, and composed of carbon and hydrogen. Its specific gravity is from ·753 to ·900. Naphtha is found in various parts of the world, and is believed to be produced by the action of heat and pressure in the earth on organic matter. In some parts of Persia, and at Rangoon in the Birman empire, it issues in great quantities from the earth. At the latter place the wells in which it exhibits itself are so numerous that 412,000 hogsheads are collected annually. On the shores of the Caspian Sea, in the Duchy of Parma, and in the United States, large quantities are found, and considerable use is made of it. In Birmah the natives use it as a lamp oil, and, mixed with earth or ashes, as fuel. The inhabitants of Bakou, on the Caspian, cause the vapour to pass through earthen tubes, and as it passes out set fire to it, and thus employ it both for giving light and for cooking. The spring at Amiana in the Duchy of Parma, is used for illuminating the city of Genoa. Naphtha is used for medicine internally, as a stimulant, and externally as a lotion in cutaneous affections. Naphtha contains the substance called *Paraffine*, which, when obtained in any quantity, is now so much valued and used for the purpose of lubricating machinery.

Napoleona.—A genus of plants. A synonym of BELVISIA.

Narcissus.—A genus of monocotyledonous plants belonging to the nat. ord. *Amyrillidaceæ*, and forming the type of the sub-order *Narcisseæ*. This genus comprises a considerable number of herbaceous plants, with bulbous roots, and cylindrical or angular stems, terminating in one or several white or yellow flowers. Many of the species are cultivated in our gardens as ornamental plants. The sweet scented narcissus, *N. odorus*, is one of the most common. It grows spontaneously in the west and south of France, in the meadows and olive grounds of Lucca, &c. The flowers are yellow, and sweet scented. The jonquil, *N. Jonquilla*, is a very common plant in all our gardens. It is a native of most parts of temperate Europe, on the borders of the Mediterranean, in Italy, &c. Its bulb is small, its leaves are green, and its yellow flowers exhale a sweet odour. The most abundant species, however, is perhaps the *N. poeticus*, which grows wild in all the meadows throughout France, and is found in some parts of Great Britain, Austria, and Italy. It bears only one flower, which is white and sweet scented. The bulb of this species at one time enjoyed a great reputation as an emetic. This property is possessed by other species also, and the bulbs of the daffodil, *N. pseudo-narcissus*, a species perhaps even more common than the preceding, were at one time during the great continental war, attempted to be introduced as a substitute for ipecacuhana.

Nardostachys.—A genus of dicotyledonous plants belonging to the nat. ord. *Valerianaceæ*, and consisting of herbs, with sweet scented perennial roots. *N. Jatamansi* is the true spike-nard (*νάρδος*) of the ancients. It is a dwarf plant with a long hairy tap-root, and is a native of Nepâl and the Himalayan mountains, &c. It is considered in the East a remedy for a number of diseases, and appears to be really serviceable in cases of epilepsy and hysteria. It is likewise much esteemed as a perfume.

Narthex.—*The Assafœtida.* See FERULA.

Nasalis. *The Proboscis Monkey.*—A genus of monkeys belonging to the family *Simiidæ*, established for the reception of a peculiar species called the kahau, or proboscis monkey, *N. larvatus* (*Presbytis nasica*). See PRESBYTINA.

Nasens.—A genus of acanthopterygious fishes belonging to the family *Theutidæ*, and distinguished by having their tail furnished with fixed sharp edged plates instead of spines. The most common species, *N. fronticornis*, has the front part of the head produced into a horn, and is about two feet long. It abounds in great numbers at the Isle of France, where troops of 200 or even 400 individuals may be seen at once. Its flesh is not esteemed though it is eaten by the negroes, who salt it.

Nassa.—A genus of gasteropodous *Mollusca* belonging to the family *Muricidæ*, and containing numerous species, most of them small, plain coloured shells, and widely distributed, being found in the arctic, tropical, and antarctic seas.

The shell is somewhat like *buccinum*, being ovate, with a short spire, and the columellar lip callous, expanded, forming a tooth-like projection near the anterior canal. The operculum is horny, ovate, with the nucleus apical, and the outer edge dentated or serrated. About sixty-eight recent species are found, and nineteen fossil, in the eocene formation.

Nasturtium.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*, and deriving its name, according to some etymologists, from "Nasus tortus," because the piquant taste of some of the species causes the nostrils to pucker up. This genus contains a number of species, which are herbs growing in fresh water, and dispersed all over the globe. One of the most common and best known is the water cress, *N. officinale*, which occurs in rivulets and springs in all parts of the world. The water cress is one of the most useful of all the cruciferous plants in a medicinal point of view, especially as a remedy for, and a preventive against scurvy. It forms also a salubrious article of food, and an immense consumption of it annually takes place in this country and on the continent. In the neighbourhood of London it is cultivated for the table to a very great extent.

Nasua. *The Coatimondi.*—See URSIDÆ.

Natatores (*natare*, to swim). *Web-footed Birds.*—An order of birds corresponding with ANSERES.

Natica.—A genus of sessile-eyed gasteropodous *Mollusca*, belonging to the tribe *Edriophthalma*, and forming the type of the family *Naticidæ*. The genus contains a number of species of shells of a nearly globular shape, thick and smooth, with a callous inner lip and a thin polished epidermis. Most of them are umbilicated, and they possess a sub-spiral operculum, which in some is shelly and in others horny, affording good characters for dividing them into sub-genera. They are all marine, frequenting sandy and gravelly bottoms. They are carnivorous animals, feeding on smaller bivalves, and being themselves destined to become the food of the cod and haddock. Their eggs are agglutinated into a broad and short spiral band, composed of fine sand very slightly attached, and resting free on the sands. About ninety species of *Naticidæ* are described as recent, and 260 fossil.

Natrix.—A genus of snakes, belonging to the family *Colubridæ*, and destitute of poison fangs. The common ringed snake of England, *N. torquata*, is the best known species of the genus. This animal is common in England, and grows to the length of three feet. It is quite harmless, and is often tamed. It feeds upon mice, young birds, frogs, &c. During the winter the ringed snakes retreat to the hollow roots of old trees, banks of hedges, &c., where they remain, often coiled together in considerable numbers till the warmer season commences.

Nauclea.—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ*, and composed of climbing trees and shrubs inhabiting intertropical countries. One or two species, natives of India and the Philippine Islands, are useful trees, the wood answering for making furniture, &c. The most important species, however, though by many botanists made a distinct genus, *Nauclea* (*Uncaria*) *gambir*, is a climbing shrub growing in Penang, Sumatra, Malacca, &c., and yields the substance known in this country by the name of catechu or terra japonica, and in India by that of gambir. This substance is prepared either by boiling the leaves in water, and evaporating till a thickish substance remains, or by cutting the leaves and young branches into small pieces, and bruising and steeping them in water for some time. The matter deposited is then removed and dried. Catechu is a strong astringent, and has been much used in diarrhœa and dysentery. It is also used by the natives of Bencoolen mixed with betel leaf and areca nut for chewing. The Chinese and natives of Sumatra employ it for tanning, and from recent experiments it is found to contain a large quantity of tannin. It has lately been used in this country in calico printing, as it produces different shades of brown.

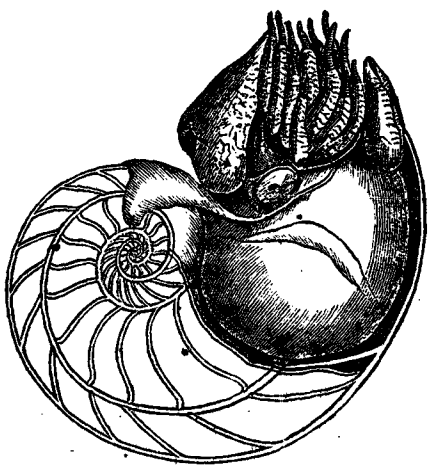
Nauclerus.—A genus of accipitrine birds. See MILVINÆ.

Naucoris (ναῦς, a ship; κόρις, bug). *Water Bug.*—A genus of hemipterous insects belonging to the family *Nepidæ*, and containing several species, which are found in ponds and still water. *N. cimicoides* is the type. It swims with great swiftness, and often leaves the water during the night to take a flight to some other pond. It is a voracious creature, feeding upon all kinds of aquatic insects, and is equally destructive in its larva and its perfect state.

Naucrates.—A genus of acanthopterygious fishes belonging to the family *Scomberidæ*. The principal species belonging to the genus is the pilot-fish, *N. ductor*. This fish is about the size and shape of the mackarel, and is marked with five dark blue transverse bands passing round the body. The pilot-fish often follows a ship for weeks together, and derives its name from a belief that sailors have, that it acts as a pilot directing sharks where to obtain a good meal, and warning them how to avoid baits. Certain it is, out at sea, when sharks are about the ship, there the pilot-fishes are also, often in numbers, and swimming round about and underneath them with perfect impunity, and apparently a good understanding existing between them.

Nautilidæ.—A family of mollusceous animals belonging to the class *Cephalopoda*, and order *Nautilophora* of Gray, or *Tetrabranchiata* of Owen. The animals of this family differ from all the other cephalopods, by having numerous tentacula in two series, a large fleshy appendage on the head, serving the animal as a foot for locomotion, and a discoidal or involute shell with few whirls, divided internally into cells or chambers by a series of partitions, and a tubular syphon

passing through them. The last chamber is by far the largest and most capacious, and in it the body of the animal is lodged. The genus *Nautilus* is the type of the family, and the only recent genus belonging to it. The animal of the *Nautilus* has only of late years become known to naturalists, though the shells themselves were known to the ancients. The fleshy appendage on the head, which the animal appears to use as a foot when walking, is, when the animal withdraws itself within the shell, adapted as a hood to protect it. The tentacles which surround the head are very numerous, and are contained in fleshy sheaths. The eyes are large and prominent, and the mouth is armed with strong parrot-beak-shaped mandibles. The animal is so placed in the shell that the ventral region corresponds with the external side of the shell. Little is known of the habits of the nautilus. It appears that they live upon other mollusca, and crustacea, and it is presumed by some naturalists that the umbilicated species are males, and the imperforated shells are females. The most common species is the pearly nautilus, *N. Pompilius*, which is a native of the seas of India, especially about the Molucca Islands. At particular seasons these shells are carried in great numbers by the winds and currents on to the coast of the Nicobar Islands. The natives, it is said, smoke-dry the animals and lay them up as a part of their winter provision. A number of fossil species of *Nautilus* are found in abundance in the marine strata, in various parts of Europe, Asia, and America. The other fossil genera of the family are *Orthoceras*, with a straight shell; *Lituites*, with a discoidal produced shell; *Trochoceras*, with a spiral shell; *Clymenia*, with a discoidal shell; *Gomphoceras*, *Phragmoceras*, and *Cyrtoceras*, all of which have been referred along with *Orthoceras* to a separate family, *Orthoceratidæ*.



Nautilus pompilius—Pearly Nautilus.

Nautilograpsus.—A genus of *Crustacea*. See GRAPSUS.

Nautilus.—See NAUTILIDÆ.

Navicella.—A genus of gasteropodous *Mollusca* belonging to the family *Neritidæ*, having a shell of an elliptic or convex form, very open, and resembling in some degree a patella. The operculum is shelly, subquadrate, with a lateral articulation, and nearly concealed between the foot and the viscera. The species inhabit the rivers of India, the Philippine Islands, &c.

Navicula.—A genus of DIATOMACEÆ.

Nebalia.—A genus of entomostracous crustaceans. See PHYLLOPODA.

Necrobia.—A genus of beetles. See CLERIDÆ.

Necrophorus (*νεκρος*, a dead body; *φορος*, a carrier). *The Sexton Beetles.*—A genus of insects belonging to the pentamerous *Coleoptera*, group *Necrophaga*, and family *Sylphidæ*. This genus contains about forty-five species, natives of Asia, Europe, and America. Their mandibles are entire, and their antennæ are longer than their head, and terminate in a round club. These insects, from their habits, are commonly called sexton beetles, and are remarkable for the subtle sense of smell they possess. They fly swiftly, and are constantly seeking out by their scent for the dead bodies of animals. In Russia, where dead bodies are buried in shallow graves, the sexton beetles may be seen in hundreds in the churchyards. They dig a hole in the earth over the corpse, and take up their abode in the substance of the body. In this and other countries where the graves are deep, they are obliged to take up with dead moles, rats, mice, small birds, &c., which they find out as soon as putrefaction commences. Upon finding an animal to their taste they immediately commence digging a hole underneath its body, and in the course of twenty-four hours, or so, by dint of assiduous labour they succeed in completely burying it. There they take up their abode, feeding upon the dead carcase, and the female speedily lays her eggs in its substance. These quickly hatch, become larvæ, and feed, like their parents, upon the putrid matter, till they acquire their full growth, when they bury themselves in the earth to the depth of several feet, and remain there for three or four weeks, at the end of which they come forth perfect insects.

Nectandra.—A genus of laurels. See LAURACEÆ.

Nectariniidæ (= **Promeropidæ**). *The Honey-suckers.*—A family of birds belonging to

the tenuirostral tribe of the order *Passeres*. The birds of this family are remarkable for the brilliancy of their plumage; their beak is arched, pointed, and compressed, and they live upon the juices of flowers. This family may be divided into two groups, or sub-families, the *Nectarininæ* (= *Promeropinæ*) and the *Cærebinæ*. The *Nectarininæ* are also called *Cinnyridæ*, or sun birds. They are chiefly confined to the torrid zone, and are generally of small size. The males have a plumage adorned with most brilliant metallic colours during the love season, and approach in this respect the humming birds, of which they seem to be the representatives in the eastern part of the world, being principally found in the Indian archipelago and Africa. Like them too they hover on the wing when they feed. They are of a lively disposition, and sing agreeably. Their feet are rather slender; the edges of their long and slender beaks are finely serrated, and their tongue is slightly forked, or bifid. *Cinnyris splendida* is a beautiful bird, a native of Africa, and is rather more than five inches long. The head and throat are of a deep violet blue, tinged with gold on the crown; upper part of the neck, back, wing, and tail coverts, of a deep but very brilliant golden-green. The breast is barred across with bright red, beyond which the belly is of the same violet hue as the throat, while the wings, tail, bill, and legs, are black. The species we have selected for representation is an Abyssinian bird, *Nectarinia tacazza*. The *Cærebinæ*

Nectarinia tacazza.

are exclusively natives of the New World and Australia; the feet are stronger than in the preceding group, the bill is shorter than the head, and the tip of the upper mandible has a distinct notch. *Dacnis cyanocephala* is a common bird in Brazil, appearing to be spread over the whole extent of that country. The male is of a changeable blue colour, the throat, back, tail, and wings black, while the female is green, with the head, cheeks, and scapulars blue. It frequents the same trees as the humming birds, hopping from flower to flower and extracting the nectar from each; but this is not done on the wing, as is the case with the humming bird and sun bird. A species found in Australia, *Dicæum hirundinaceum*, differs in its habits from the others of this family. When perched on the branch of a tree, it sits more upright than the sun birds, and when on the wing, has a quick darting flight. Its appearance is more that of a swallow than either of the two forms mentioned above. It has a very animated and long continued song, but this is uttered so inwardly, that it is almost necessary to stand beneath the tree upon which the bird is perched before its note can be heard. The beautiful purse-like nest of this bird is composed of the white cottony substance found in the seed vessels of many plants, and it lays three or four eggs.

Nectura.—A genus of *Amphibia*. See SIRENIDÆ.

Nelumbiaceæ.—A nat. ord. of dicotyledonous plants of which the genus *Nelumbium* is the type and solitary genus. The species are magnificent herbaceous plants, which grow in fresh water in the hotter parts of Asia and America. They have a thick root, and the petioles and peduncles which support the leaves above the water are very long. The leaves are large, round, concave, and peltate, and the flowers are large and handsome, of a white, rosy, or yellow colour, the corolla consisting of numerous petals placed one above the other in several rows. The fruits are small one-seeded nuts. *N. speciosum* (*Nymphæa Nelumbo*) is one of the most beautiful of all herbaceous plants, the flowers being eight or ten inches in diameter when fully expanded, of a rose colour, and very fragrant, having the odour of anise. The leaves are orbicular, glabrous, from twelve to eighteen inches in diameter, and attached exactly in the centre to the petioles which support them. The fruits are about the size of a hazel nut, and afford a wholesome kind of food, having a taste more delicate than that of almonds. In some parts of India, in Japan, &c., the natives hold this plant in great veneration, esteem it as a sacred plant, and consider it as the symbol of fertility. The images of their gods are frequently made to sit on its large leaves. It was known to the ancients, and is described by Herodotus, &c., as existing in the Nile. It is the "faba Ægyptiaca," the Pythagorean bean, and is supposed by many to be the celebrated lotus of antiquity. It has now, however, disappeared from Egypt, and may originally have only been cultivated there. Both roots and seed are esculent, and are accounted by the Easterns as cooling and strengthening. In China the roots are laid up in salt and vinegar for winter use. *N. luteum* is a native of North America, in Florida, Carolina, &c. It resembles the preceding, but its flowers are always yellow and somewhat smaller. The fruits are edible, but the plant does not occur in sufficient abundance to be of much value as an article of food.

Nemafoidea (νημα, a thread; ειδος, form).—An order of intestinal worms. See ENTOZOA.

Nematus (νημα, a thread).—A genus of hymenopterous insects belonging to the family *Tenthredinidæ*, and containing a good many species, all natives of Europe. The larvæ are

called "false caterpillars," have twenty feet, and live upon the leaves of different plants. Some of them undergo their metamorphosis by entering the ground, and spinning cocoons; others form a gall upon the leaves, in the substance of which they change their form. The larvæ of *N. salicis* feed on the leaves of the willow, and those of *N. ribesii* and *N. grossulariæ* on the currant and gooseberry. The larvæ of these insects frequently commit great devastation upon trees, the loss amounting to large sums annually.

Nemertes.—A very curious genus of marine worms, which has also received the names of *Borlasia*, *Linæus*, &c. The species are often very long, frequently growing to the length of several yards, and have the appearance of long, narrow ribands. Some of the species are found on our own coasts.

Nemesis.—A genus of parasitic *Crustacea* belonging to the order *Siphonostoma*, and family *Dichelestidæ*. Two or three species are found living on sharks.

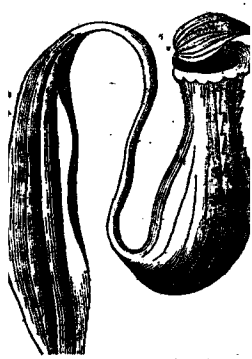
Nemocera.—A tribe of insects belonging to the order *Diptera*, and containing the numerous species of the genera *Culex* and *Tipula*. These insects are generally seen assembling in great swarms, balancing themselves in the air to and fro, and dancing in the sunshine.

Nemoura (*νημα*, thread; *ουρα*, tail).—A genus of insects belonging to the order *Neuroptera*, and family *Perlidæ*. The species are small slender insects, of a grayish colour, tinged with brown, and are found in moist places, and shady woods. The larvæ live in the water, and the perfect insects appear in spring and summer.

Neotragus.—A genus of antelopes. See ANTILOPEÆ.

Nepa. *The Water Scorpion.*—A genus of insects belonging to the order *Hemiptera*, group *Heteroptera*, section *Hydrochorisæ*, and forming the type of the small family *Nepidæ*. The species are not large, and inhabit fresh water ponds and ditches, &c. Their body terminates in two long setæ, by means of which they acquire a supply of air for respiration when immersed in the water or mud. They swim slowly, and live upon small aquatic animals. *N. cinerea* is about eight lines long, and bites sharply when touched.

Nepenthes (*νηπενθης*, something which dispels vexation). *The Pitcher Plant.*—A genus of dicotyledonous plants belonging to, and forming the only representative of the family *Nepenthaceæ*. The species are few in number, and are somewhat shrubby plants, growing in Madagascar and tropical Asia, and curious for the singular organization of their leaves. These are alternate, slightly sheathing at the base, with a foliaceous petiole which becomes very much narrowed, and then expands again so as to form, by being folded on itself, a pitcher, or *ascidium*, as it is called, at its extremity. This pitcher, in some species, is large enough to contain a wine glassful of water, and has the mouth covered by the lamina of the leaf, which is articulated to it, and forms a lid exactly like that of a water jug. These plants are highly praised by some writers as affording



Ascidium or pitcher of *Nepenthes*.

valuable aid to travellers for quenching their thirst, but it appears that their importance in this respect is much exaggerated, as these plants are always found in moist and swampy places where water is not scarce. The flowers are small, of no beauty, and arranged in cylindrical racemes. The best known species is *N. distillatoria*, a native of Ceylon and continental India. The water found in the pitchers is secreted by a peculiar glandular apparatus with which they are lined, and is found to contain binoxalate of potash.

Nepeta.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing about seventy species, which are found abundantly in the temperate regions of Europe and Asia. *N. Cataria*, catmint, is a British species, and grows throughout the whole of Europe and Middle Asia. It is from two to three feet high, with a downy or mealy stem, and cordate, deeply crenate leaves, clothed with a whitish pubescence beneath. The whole plant has a strong smell between mint and pennyroyal, and derives its specific and English names from the fact that cats are very fond of it. These animals roll themselves upon it and tear it to pieces apparently with much pleasure. The ground ivy, *Glechoma hederacea* of most authors, is now placed in this genus. It is the *Nepeta Glechoma*, and is a native of Britain, most parts of Europe, and the north of Asia. The leaves of ground ivy were formerly thrown into the vat with ale to clarify it and give it a flavour.

Nepheline (*νεφελη*, cloudiness).—A mineral consisting of alumina, silica, and soda, and found in the cavities of granular limestone at Monte Somma, Vesuvius, and in the lava of Capo di Bove, near Rome. It is a white, glassy, and generally translucent substance, occurring in

small crystals of a hexagonal form. Specific gravity, 3·27; hardness, 2·5. It derives its name from becoming nebulous when placed in nitric acid.

Nephelium. *The Litchi.*—See SAPINDACEÆ.

Nephrite (νεφρος, the kidney). *Jade* or *Axestone.*—A mineral substance which occurs in masses, and is composed of silica, alumina, magnesia, oxide of iron, and a trace of oxide of chromium. It is of a compact structure, very tough, and of a leek-green colour generally. Specific gravity, 2·9 to 3; hardness, 7. It is found in China and New Zealand, in which parts of the world it is carved into ornaments and images, and worn as a charm. It is also found in America and in Iona. It was at one time supposed to be useful in diseases of the kidney, hence its name.

Nephrops (νεφρος, kidney; ωψ, the eye).—A genus of decapodous *Crustacea* belonging to the section *Macroura*, and family *Astacidæ*. The typical species of the genus is the Norway lobster, *N. Norvegicus*, one of the most beautiful of the larger *Macroura*, and distinguished from the common lobsters by its first pair of feet being both of the same size. Its general colour is pale flesh, rather darker in parts, and the pubescence is light brown. It is for the most part a northern species, and is found on the coast of Norway in great abundance. It is said to be the most delicate flavoured of all the crustacea, and is frequently brought to the London market, as well as to those of other parts of England, Ireland, and the Channel Isles.

Nereidæ.—A family of animals belonging to the class *Annelida*, and having the genus *Nereis* as the type.

Nereis.—A genus of annelides. See ANNELIDA.

Nerita.—See NERITIDÆ.

Neritidæ.—A family of scutibranchiate gasteropodous *Mollusca*, containing upwards of 200 species of shells, the greater proportion of which are natives of warm seas. The shells are generally thick, semi-globose, with a small spire, flattened above, and not umbilicated. The mouth is semi-lunate, and the operculum is shelly, subspiral, and articulated. The genus *Nerita* is the type, and contains about 116 species, all marine, and distributed throughout nearly all the seas of warm climates. The shells are solid, covered with a horny epidermis, and having a broad, flat columella, with its inner edge straight and toothed. A number of species of the family are inhabitants of fresh water. The genus *Neritina* contains about seventy-six species. These very much resemble the neritæ, but are thinner, more polished, and the operculum has a flexible border. The shells are generally rather more globular, and more ornamented with colours than the neritæ, but like them are for the greater part natives of warm climates, a few only being found in Europe. One species is found in England. Another fresh water genus is NAVICELLA. A considerable number of fossil species of *Neritidæ* occur in the lias and eocene beds.

Neritina.—See NERITIDÆ.

Nerium.—A genus of plants containing amongst others the oleander. See APOCYNACEÆ.

Nestor (a proper name).—A genus of scansorial birds belonging to the family *Psittacidæ*, sub-family *Cacatuina*, and forming a sort of connecting link between the parrots and cockatoos. It is distinguished by having a very long high beak, the upper mandible compressed, hooked at the tip, and twice the length of the lower. The cheeks are covered with feathers. Two or three species are known. The long billed or Philip Island parrot, *Nestor productus*, is the most

Nestor productus.

familiar. It is a very pretty species, only to be found in Philip and Norfolk Islands, and the most eastern portions of New South Wales. It lives amongst the rocks and on the loftiest trees, and feeds upon the nectar of the flowers of the *white-wood tree* (a species of hibiscus), and the leaves of succulent plants and soft fruits. In its wild state the cry of this bird is harsh and inharmonious, but it is capable of learning to imitate the human voice to a remarkable degree. A closely allied species, if not identical, has also been found in New Zealand, where it is called the ka-ka.

Neuroptera (νευρον, a nerve; πτερον, a wing).—An order of insects, characterized by their wings, which are four in number, being strongly and minutely reticulated, membranous, generally naked, and usually about the same size. The larvæ are provided with six legs, and their metamorphosis is usually semi-complete. They are all carnivorous, and some of them live in the water, and others in the ground. To this order belong the dragon-flies, LIBELLULA; the May-flies, EPHEMERA; the ant lion, MYRMELEON, and the caddis-flies, PHRYGANIEDÆ.

Nickel.—A metal, when pure, of a silvery-white colour, not tarnishing by exposure to the

air, nor by being kept under water. It is found in combination with sulphur, antimony, and arsenic. It is one of the magnetic metals, and is always found in small quantities in meteoric stones. Specific gravity when melted, 8·279; when hammered, 8·666. It is malleable both cold and hot, and may without difficulty be hammered out into plates not exceeding $\frac{1}{100}$th of an inch in thickness, and is sufficiently ductile to be drawn out into wires $\frac{1}{80}$th of an inch in diameter. Till lately the uses of nickel were very limited, but it has now become employed to a considerable extent. An alloy formed with copper and zinc is known under the name of German and nickel silver, and is extensively used in the manufacture of various domestic utensils as a substitute for silver.

Nicothoa.—A genus of parasitic entomostracous *Crustacea* belonging to the order *Siphonostoma*, and tribe *Pachycephala*. It is one of the most remarkable forms of all the animals belonging to the order to which it belongs. The body is slender and elongated, but the thorax is enlarged laterally in the form of two large wing-shaped lobes. Like the other species of the *Pachycephala*, the nicothoa is more completely parasitical than those belonging to the tribe *Peltocephala*. They are found in great abundance adhering to the gills of the common lobster. The young are similar in appearance to those of the cyclops, and undergo considerable changes in their progress to maturity. When they have once commenced their parasitic life, they soon become immovably fixed in the position they have chosen. The *N. astaci* is the only species as yet known.

Nicotiana. *The Tobacco genus.*—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and containing about forty different species. They are herbaceous, rarely shrubby plants, generally covered with clammy hairs, and natives, for the most part, of the warm parts of America, a few growing also in the East, and one, *N. rustica*, being found in all the four quarters of the globe. The species most commonly used commercially is the common Virginian or sweet-scented tobacco, *N. Tabacum*. This plant grows spontaneously in America and the West Indies, and is now extensively cultivated in the warmer portions of the United States, in Virginia, &c. It is the species most commonly used for making tobacco and cigars, and was the first which was known to Europeans, the Spaniards finding it in the West Indies upon their discovering these islands. The name *Tobacco* is derived from the Indian word *Tabacos*, the name which the Caribbees gave to the pipe in which they smoked the plant. That of *Nicotiana* was given after Jean Nicot, who sent seeds of the tobacco plant into France in 1560. Several other species yield tobacco also, as *N. macrophylla*, an American species, known by the name of Orinoco tobacco, and from which the milder Havannah cigars are made; *N. rustica*, commonl called English tobacco, from its having been t species first introduced into England, where grows very well, and which produces the lattak tobacco, and those sold in our shops as Turki tobaccos; *N. repanda*, a native of Cuba, and us for making the small cigars known as Queen' &c., &c. The narcotic effects of tobacco depe upon the presence of a peculiar oily-like alkalo called *Nicotine*. Tobacco is employed med cinally as a sedative. In large doses it is a energetic narcotic poison.

Nigella (a diminutive of *niger*, black).—genus of dicotyledonous plants belonging to th nat. ord. *Ranunculaceæ*, sub-order *Helleboreæ* and composed of herbaceous annual plants, grow ing in the Mediterranean region of Europe an the East. The flowers are pretty large, of a blu yellowish, or white colour, placed solitary on th tops of the stems or branches, and the leave are capillary, multifid, finely cut like fenne and often surround the flowers like an involucr The species are hence known by the names devil in a bush, or devil in a mist. The seed are compressed, of a black colour (hence th generic name), and possess an aromatic flavou and pleasant smell. Those of *N. sativa*, a nativ of the neighbourhood of Montpellier, and of Nort Africa, are often used to adulterate pepper. The are also employed on the continent as a condi ment, and have been recommended as carmina tives.

Noctiluca (*nox*, *noctis*, night; *lucere*, shine).—A genus of minute animals, the re position of which, in the animal kingdom, is sti doubtful. By most authors it is placed among the *Acalephæ*. The only species, *N. miliaris*, a small, globular, gelatinous, transparent body furnished with a filiform tentacle. It occurs i great abundance on our coasts, and on those France, and is amongst the chief causes of th luminosity of the sea at night. It is about th size of a pin's head.

Noctua (*nox*, night).—See Noctuidæ.

Noctuidæ.—A family of insects belonging the order *Lepidoptera*, section *Heterocera*, an having as its type the genus *Noctua*. This genus at first embraced all the species now contained i the family; but their number has so increased 800 having been described, that it has become necessary to form of the genus a large family The species have the body robust, the antennæ generally simple and not pectinated, and the wings of moderate size, strongly nerved, and with peculiar ear-like spots on the disc of the fore ones. The larvæ are generally naked, and have sixteen feet, live upon the leaves of plants and undergo their metamorphosis under ground in cocoons. The perfect insects are generally o moderate size, and are chiefly found in woods gardens, and meadows. Most of them, as their name implies, only fly by night, reposing during the day in the crevices of the bark of trees, old

walls, &c.; but some are met with also flying at mid-day. They are found spread over all Europe. The colours are generally sombre; but in some, as the scarlet underwing moths, *Catocalæ*, they are more gaily ornamented, and in the *Plusiæ* are bedecked with spots and patches of silver.

Nocturna (*nocturnus*, belonging to the night).—One of the great divisions of the order *Lepidoptera*, including those insects generally known by the name of moths. They correspond with the old genus *Phalæna* of Linnæus, and form part of the group *Heterocera* of Westwood.

Nostoc. See NOSTOCHACEÆ.

Nostochaceæ.—A family of confervoid *Algæ*, consisting of plants found forming gelatinous strata, or definitely formed gelatinous balls or masses, either on damp ground, or floating at the bottom of water. The genus *Nostoc* is the type of the family, and consists of a frond of a gelatinous substance, in which are imbedded numerous more or less beaded filaments.

Nothosaurus (*νοθος*, spurious; *σαυρος*, a lizard).—A genus of fossil reptiles, the remains of which are found in the muschelkalk of Wirtemberg and Lorraine. In the form of the vertebræ and limbs, and the length of their neck, they offer a good deal of analogy with the plesiosauri, but in the form and construction of their head they resemble the tortoises. The teeth are generally small, conical, striated, and implanted in separate sockets. There are three species described.

Notommata (*νωτος*, back, *ομμα*, eye).—A genus of minute animals belonging to the class *Rotatoria*, the species of which are rather numerous, and are found in stagnant ponds and ditches.

Notonecta (*νωτος*, back; *νηκτος*, swimming). *The Boat Fly.*—A genus of *Hemipterous* insects belonging to the group *Heteroptera*, section *Hydrochorisæ*, and forming the type of the family *Notonectidæ*. The insects belonging to this genus have the elytra membranous in the posterior part, their body somewhat in the shape of a boat, and their hind feet very long, generally stretched out at full length, and acting the part of a pair of oars. They swim always on their back, and generally in an inclined position. They are found in ditches and ponds, most frequently on the surface of the water, but as soon as any person approaches them, they descend immediately, and do not reappear for some time. They are voracious insects, living upon the larvæ of ephemeræ, &c. *N. glauca* is a common species, and bites sharply when incautiously handled in the water.

Notornis (*νοθος*, spurious; *ορνις*, bird).—A genus of birds belonging to the order *Grallæ*, and family *Rallidæ*. The bones of what was supposed to be an extinct genus of birds, allied to the genus *Porphyrio*, were some years ago discovered in the diluvium of New Zealand, along with the remains of the large bird *Dinornis*. To this genus the name of *Notornis* was given. More recently, however, a living specimen of this curious and very interesting bird was caught in the same island, and named after its discoverer, *N. Mantellii*. A second specimen has still more recently

Notornis Mantellii.

been taken, the skins of both of which are now in the British Museum.

Novaculite.—A kind of clay slate, used as a hone stone.

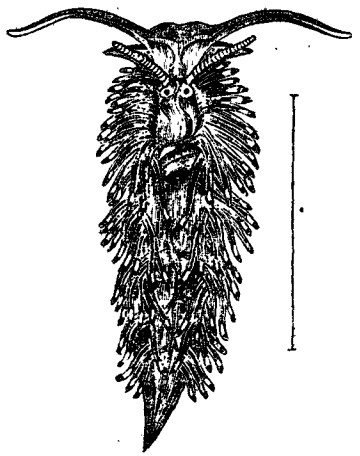
Nucifraga (*nux*, a nut; *frangere*, to break). *The Nut-Cracker.*—A genus of birds. See CORVIDÆ.

Nucleolites.—A genus of fossil *Echinidæ* belonging to the family *Galeritidæ*, and found in the crag, &c.

Nucula (*nucula*, a little nut).—A genus of bivalve *Mollusca* belonging to the family *Arcadæ*. The shells of this genus are distinguished by being of a trigonal shape, covered externally with an olive epidermis, by being pearly internally, and having a series of numerous sharp teeth on each side of the prominent cartilage pit. A considerable number of species are described, all marine, and of small size, and about 100 are found fossil. *N. margaritacea*, the type of the genus, is very common in the seas of Europe, as in the North Sea and Mediterranean. The genus *Nucula* has recently been split into several others, as *Leda*, *Yoldia*, &c., and in the most recent arrangement these genera have been removed into another family.

Nudibranchiata (*nudus*, naked; *branchiæ*, gills) = GYMNOBRANCHIATA (*γυμνος*, naked; *βραγχια*, gills).—An order of molluscous animals belonging to the class *Gasteropoda*. The animals belonging to this large group are always destitute of a shell except in the embryo state, and have their branchiæ or gills always external, and placed on the back, or sides of the body. The genera and species are numerous, and are found on all coasts where the bottom is firm or rocky, from between tide-marks, to a depth of

fifty fathoms. Those of the family *Doridæ* are best known, in which the branchiæ are plume-like, forming a circle in the middle of the back. In the *Eolidæ*, the branchiæ are papillose, and are arranged in transverse rows along the sides of the back; the tentacles being sheathless and none retractile. *Eolis Drummondii*, a British species, will give a good idea of the animals of this



Eolis Drummondii.

order of mollusca. The *Tritoniidæ* have the branchiæ laminated, plumose, or papillose, arranged along the sides of the back, and the tentacles are retractile into sheaths.

Nulliporidæ (*nullus*, none; *porus*, a pore).—A genus of corallines. See CORALLINACEÆ.

Numenius. *The Curlew.*—See SCOLOPACIDÆ.

Numida. *The Guinea Fowls.*—A genus of birds belonging to the order *Gallinæ*, family *Phasianidæ*, sub-family *Meleagrinæ*, and remarkable for their general form. The body is round and bunchy, a form owing to their having a short pendant tail, a short slender neck, and a small head, apparently out of proportion to the size of the body. The legs are short, and their plumage is dark bluish-gray, sprinkled with round white spots of different sizes. The pintado or common Guinea fowl, *N. meleagris*, was well known to the ancients, and amongst the Greeks was considered as the emblem of fraternal affection. It is a native of Africa, but is now domesticated in various parts of Europe, though it still retains a considerable amount of its original wildness. Its flesh is excellent, and approaches in flavour to that of the pheasant. The Guinea fowl has a very disagreeable voice, which has been compared to a door turning upon rusty hinges, or to an ungreased axletree! In a domestic state these birds resemble in habits and kind of food our common poultry, but from the difficulty of rearing the young they are not bred in equal numbers.

Nummulites (*nummus*, a coin or piece of money).—A genus of minute animalcules. See FORAMINIFERA.

Nuphar. *The Yellow Water Lily.*—A genus of dicotyledonous plants belonging to the nat. ord. *Nymphæaceæ*, and formed to contain a number of plants separated from the genus *Nymphæa*, and distinguished by having yellow flowers. The species of *Nuphar* are natives of the fresh water ponds and lakes of Europe, Asia, and North America. From the thick root which is lodged in the mud spring petioles and peduncles to carry the leaves and flowers above the water, and which are of a proportionate length to the depth of the water in which they grow. The leaves are large, heart-shaped or sagittate, and the flowers are smaller than those of the *Nymphæa*, and always of a yellow colour. *N. lutea* is a fine plant, and grows abundantly in the lakes and slow running streams of most parts of Europe. It is common in England; the leaves are large and float on the surface, and the flowers, with large sepals and small petals, exhale an odour of port wine.

Nyctagineæ.—A family of dicotyledonous plants belonging to the division *Apetala*. The family is well defined, and contains only a few genera, the species of which are herbaceous with a tuberous root, or shrubby with spiny stems. They grow chiefly in intertropical countries, particularly in the warm parts of America, and some of them, as the *Bougainvillæa*, are cultivated as ornamental plants.

Nyctago.—A genus of plants—synonymous with MIRABILIS.

Nyctanthes (*νυξ*, night; *ἄνθος*, a flower.)—A genus of night-blowing plants. See JASMINACEÆ.

Nyctea. *The Snowy Owl.*—See STRIGIDÆ.

Nycteribia (*νυξ*, night; *βιος*, life).—A genus of insects belonging to the order *Diptera*, section PUPIPARA, and family *Nycteribiidæ*. The genus *Nycteribia* is the only one in the family, and the species, which in many respects are allied to the horse-flies, *Hippobosca*, have neither wings nor balancers. They live parasitic upon the bodies of bats, running with great swiftness when in their proper position, but when removed being only able to walk with difficulty.

Nyctibius.—A genus of birds belonging to the fissirostral tribe of the order *Passeres*, and family *Caprimulgidæ*, or goat-suckers. The typical species is the great ibijau, *N. grandis*, a native of Cayenne, and about the size of a common owl. Its habits are solitary, the bird haunting hollow trees, and preferring those which are near the water.

Nycticebus (*νυξ*, night; *κηβος*, ape).—A genus of quadrumanous animals. See LEMURIDÆ.

Nycticorax. *The Night Heron.*—A genus of herons. See ARDEIDÆ.

Nyctinomus (νυξ, night; νομος, habitation).—A genus of animals belonging to the class *Mammalia*, order *Cheiroptera*, family *Vespertilionidæ*, and sub-family *Noctilionina*. The species belonging to it are carnivorous. Their outer ears are very large, and folded down on the front of the head, and their wings are extensive. The hind feet are covered with long hairs, and the tail is long and enveloped in the interfemoral membrane. The species upon which the genus is founded, *N. Ægyptiacus*, is about three inches long, reddish coloured above and brown beneath. It is found in the tombs and vaults of the large ruins in Egypt. About six other species are described.

Nympha.—The stage of an insect's life, intermediate between the larva and the perfect insect. It is also called *Pupa* and *Chrysalis*.

Nymphæa. *The Water Lily.*—See NYMPHÆACEÆ.

Nymphæaceæ.—A nat. ord. of dicotyledonous plants containing several species of great beauty, growing in fresh water in various parts, but especially the warmer portions of Europe. Fixing their large thick root in the mud, at the bottom, they send up long petioles and peduncles to carry their leaves and flowers above the surface of the water. The leaves are large, round, or oval, heart-shaped, and float on the surface. The flowers are large and handsome, generally of a white colour, though sometimes blue, red, or yellow. Some of the species have leaves and flowers of an immense size. See VICTORIA and NELUMBIACEÆ. The genus *Nymphæa* is the type of the family, and gives it its name. It contains several species, the best known of which is the common white water lily, *N. alba*. This handsome plant grows abundantly throughout the temperate parts of Europe, and is common in the ponds and still waters of England. The canals of Holland owe a great part of their beauty to the multitudes of this plant which adorn them. The flowers are white and large, and rise a little above the water, and the leaves are large, heart-shaped, and green, and float on the surface. The fruit is thick and fleshy, and was at one time employed in large quantities, in religious houses on the continent, in consequence of the belief entertained that they possessed cooling, anti-aphrodisiac virtues. Two species of this genus grow in large quantities in Egypt. One, *N. cærulea*, has fine blue fragrant flowers rising a little above the water, and the leaves are nearly orbicular and cordate at the base. The blue water lily was reckoned sacred by the ancient Egyptians, and is seen represented in their paintings and hieroglyphics. Bundles of leaves and flowers are represented as the offerings made by them to their gods, and crowns made of these were dedicated to them. They also appear to have used the roots and seeds as food. Its root is blackish and pyriform, and is able to resist the droughts which periodically take place in Egypt. The other species, *N. lotus*, the Egyptian lotus, was still more esteemed by the ancient Egyptians, and is still found in Lower Egypt, in the Nile, near Rosetta and Damietta. The leaves are large, peltate, and orbicular, and deeply cut at their base into heart-shaped lobes which are dentated on the edges. The flowers are large and white, the green sepals having a tinge of red at the margins. The lotus was dedicated to the goddess Isis, and the fruits mixed with ears of corn were the symbol of this goddess, and the emblem of abundance. It is found represented on many of the ancient monuments of Egypt. The root is tubercular and of large size, and was formerly much used as an article of food; its taste resembles that of the chestnut. The seeds were used to make bread, and resemble millet. The modern Egyptians still use this plant as an article of food. It is the *White Lotos* of Herodotus.

Nymphalidæ.—A family of insects belonging to the order *Lepidoptera* and section *Rhopalocera*. This family contains a number of genera of butterflies, characterized by their having the club termination of their antennæ elongated, and the head generally narrower than the thorax. The posterior wings have the discoidal cellule either open, or closed by a slender nerve: they are grooved to receive the abdomen, which they entirely cover when the insect is in a perfect state of repose. Many of the species are amongst the most beautifully varied in their markings and colours of all the *Lepidoptera*, hence the names of the peacock, painted lady, Camberwell beauty, and red admiral butterflies. In many species the under side of the wings is splendidly ornamented with numerous pearl or silvery spots; hence their name of fritillaries. Some have the upper surface of the wings adorned with the most splendid silvery-blue, such as those belonging to the genus MORPHO, which comprises also some of the largest of known butterflies. Others are of a changeable gloss of intense purple in the males, as, for instance, *Apatura Iris*, the purple emperor. The genus *Nymphalis* may be considered the type of the family, and at first contained nearly all the known species. *N. populi* is one of the best known species, and is found in the southern and northern parts of Europe, in the forests where the poplar tree abounds. The caterpillar lives upon these trees, chiefly attacking the leaves at the extremity of the branches. Many other species are described. They fly high, and it is difficult to catch them.

Nymphon.—A genus of *Crustacea*. See PYCNOGONIDÆ.

Nyssa.—A genus of dicotyledonous plants belonging to the nat. ord. *Alangiaceæ*, and composed of a small number of species, which are trees growing in moist grounds and stagnant waters in North America. They have alternate leaves,

very entire or dentate, glabrous underneath, and with axillary flowers. They grow to the height of ninety feet. The wood is hard and white, and might be very useful were it not that it decays very rapidly. The fruits are the favourite food of many birds and small mammalia, as squirrels, &c.

Nyssonidæ.—A family of fossorial hymenopterous insects, united by Westwood to the CRABRONIDÆ. The species of this family are rather numerous, and appear to form their nests in the sand. Their general habits are the same as the CRABRONIDÆ.

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Obsidian.—A mineral substance named after *Obsidius*, a Roman, who brought it from Ethiopia. It is a velvet-black amorphous mass resembling bottle glass, and is hard enough to scratch glass. *Specific gravity 2·363 to 2·372. It* occurs in recent volcanic formations, and is common in Iceland, Mexico, in the Andes, and Peru. The ancients used obsidian for gems and statues. Augustus dedicated four elephants of obsidian in the Temple of Concord. The ancient Egyptians also made statues of it; and the natives of Mexico and Peru were accustomed to make knives, sword blades, razors, and looking-glasses of it.

Oceania.—See OCEANIDÆ.

Oceanidæ.—A family of *Medusæ* belonging to the class *Acalepha* and order *Discophora*. The greater number of these medusæ are very small. The genus *Oceania* contains several species, some of which have been observed to be highly phosphorescent at night.

Octodon.—A genus of rodent animals belonging to the order *Glires*, family *Muridæ*, and subfamily *Echimyna*. Only one species, *O. degus*, is known, a small animal with soft fur, long ears, and a long tufted tail. It is a native of Chili, and burrows under brushwood fences or low thickets. They are timid animals, and at the least alarm fly in haste, carrying their tufted tails like a bent bow.

Octopodidæ (*οκτω*, eight; *πους*, foot). *Sea Spiders.*—A family of molluscous animals belonging to the class *Cephalopoda*, and characterized by their having a purse-like body without any fins, and eight sessile arms. This family contains several genera, as ARGONAUTA, *Eledona*, *Philonexus*, *Cirroteuthis*, and *Octopus*. The genus *Octopus* may be considered as the type, and contains about forty-six species. The best known is the common sea spider, *O. tuberculatus*, an ungainly looking animal, with an oval-shaped, warty, or cirrhose body, long unequal arms, with two rows of suckers, and large eyes. The octopods were known to the ancients by the name of *Polypi*, and were used as an article of food. They are solitary animals, frequenting rocky shores, and are very active and voracious. In the markets of Smyrna and Naples, and in the bazaars of India they are regularly exposed for sale. They are not easily caught, as they can adhere with great power to rocks and stones, or by means of their long arms and suckers drag their bodies into very narrow crevices, from which they are not easily removed. They also escape detection by ejecting the contents of their ink bag, and rendering the water so discoloured that they cannot be seen. Some of the exotic species are very large, their arms measuring each two feet in length. The males differ very much from the females, and in those species in which they have been observed, offer the general appearance of a detached arm of an octopod. See HECTOCOTYLUS.

Octopus.—See OCTOPODIDÆ.

Oculina (*oculus*, the eye).—A genus of stony corals belonging to the family *Madreporidæ*. These corals are generally fixed, branched, and dendroidal, with smooth, thick, short branches, covered with polypiferous cells in the form of a star, some terminal, others lateral and superficial. *O. virginea* is the common species, and is often called "white coral." It is found in the Mediterranean and equinoctial seas along with several others.

Ocypoda (*ωκυς*, swift; *πους*, a foot).—A genus of decapodous *Crustacea*. See CRUSTACEA.

Ocyptera (*ωκυς*, swift; *πτερον*, wing).—A genus of insects belonging to the order *Diptera*, and family *Muscidæ*. The flies belonging to this genus are remarkably swift of flight. The perfect insects live upon the juices of flowers. The larvæ live upon other insects. That of *O. bicolor* lives upon pentatoma grisea, and without quitting its abode changes its form. As soon, however, as it arrives at its perfect state it leaves the animal upon which as a larva it had been feeding, and goes in quest of its proper food.

Ocythoe (a mythological name).—A genus of cephalopodous *Mollusca*, synonymous with ARGONAUTA.

Odontophorinæ.—A family of partridges. See TETRAONIDÆ.

Odynerus (*οδυνηρος*, disagreeable).—A genus of solitary wasps. See EUMENIDÆ.

Oecophora (*οικοφορος*, one who carries his dwelling-place).—A genus of insects belonging to the order *Lepidoptera*, division *Heterocera*, and family *Yponomeutidæ*. The species are very small and agreeably coloured, often brilliantly so. The larvæ are not much known, but they live upon plants, some of the species attacking the leaves only, others the parenchyma of the plant itself. Others again attack the ears of corn, and eat the farinaceous substance of the seed without touching the outer covering. They multiply very rapidly, and in consequence, in various parts of

France, frequently do much damage to growing crops of wheat and barley. About thirty-six species have been described as natives of Europe.

Oedemagena (*οἰδος*, tumour; *γενα*, birth).—A genus of dipterous insects. See OESTRIDÆ.

Oedicnemus (*οἰδος*, thick; *κνημη*, thigh). *Thick Knees.*—A genus of birds, containing the stone curlew, and other birds. See CHARADRIIDÆ.

Oedocephali.—A genus of monsters. See OTOCEPHALÆ.

Oegle.—A genus of plants. See AURANTIACEÆ.

Oenanthe (*οινος*, wine; *ανθος*, flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and containing a number of species, growing in damp meadows or watery places. They possess glabrous leaves and stems, compound umbels and white flowers. They are abundant in the northern regions of the old continent, a few only being met with in America. The most important species is *O. crocata*, the water hemlock, which grows in England and various other parts of Europe. The root is fleshy, and abounds in a yellow juice, of a highly poisonous nature. It exists in the stem and leaves also; and as the plant grows in situations where cattle can reach it, it often proves fatal to them from eating it. Cases have occurred also occasionally where the root has been mistaken for ground-nuts and parsnips, and death has been the result. Linnæus was consulted in Sweden upon the cause of the death of a large number of cattle in a particular part of the country, and he found that where these cattle had fed, the *O. crocata* was very abundant. By removing the remainder of the stock from that particular pasture, he was enabled to save their lives. *O. phellandrium*, another British species, is also said to be poisonous to cattle; whilst, on the other hand, the roots of *O. pimpinelloides* are very much sought after by the natives of the parts of the country where it grows, as about Angers, in France, as a wholesome article of food.

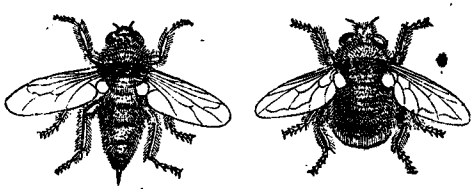
Oenocarpus (*οινος*, wine; *καρπος*, fruit).—A genus of monocotyledonous plants belonging to the nat. ord. *Palmæ*, and natives of South America. The species are lofty trees, with straight, slender, generally cylindrical stems, marked with distinct rings. *O. distichus* has a fruit which, when cooked and pressed, gives out an inodorous oil, of a sweet taste. *O. Bataiva*, called by the Indians on the Amazon the patawa, grows to a height of sixty feet. From the margins of the bases of the petioles issue numerous, long, spinous processes of a very singular character. They are from eighteen inches to three feet long, of a black colour, flattish, and generally broken or fibrous at the point. They are much sought after by the Indians, who use them to make arrows for their blowpipes. They dip the points in curari poison, and notch them three or four inches from the point, so as to make them break off in the wound.

Oenothera. *The Evening Primrose.*—A genus of plants. See ONAGRACEÆ.

Oerstedite.—A mineral occurring crystallized, and found at Arendal, Norway. It is composed chiefly of titaniate of zirconia and silica, with a little lime, magnesia, and protoxide of iron. Specific gravity, 3·269. It has a splendent, adamantine lustre, but is opaque.

Oestridæ. *The Bot-flies* or *Breeze-flies.*—A family of dipterous insects, belonging to the section *Athericera*. All the species were originally contained in the Linnæan genus *Oestrus*, but recent researches have discovered so many others, that it has been necessary to form a distinct family. The bot-flies have the appearance of large, hairy flies, the hairs being often coloured in transverse bands. In the perfect state, these insects are not very often seen, but their larvæ are exceedingly troublesome. The females deposit their eggs on the bodies of different mammiferous herbivorous animals, as the horse, sheep, reindeer, &c.; and each species of fly keeps to its own particular species of quadruped. They select with wonderful instinct the particular part of the body of the animal which is best adapted for the welfare of their progeny. Some deposit their eggs on the skin of the animal selected, causing tumours under the skin, the grubs in this case being known by the name of wornils, worbles, or wormals; others in the cavity of the nostrils, the grubs burrowing from these into the frontal and maxillary sinuses; or on such parts as the animal can reach with its tongue, and thence convey to the stomach, the grubs in this instance being called bots. After the larvæ have reached their full size and growth, they are rejected by the animals in whose body they have been nourished, and falling to the ground, enter it, and there remain to undergo their metamorphosis. These larvæ are generally thick, fleshy grubs, somewhat attenuated towards the head, and not furnished with legs. The perfect insects seem to be principally designed to propagate their species, as they are not seen to take any nourishment, and are very short lived. One of the most common species is the bot-fly of the horse, *Gasterophilus equi*, a fly about five lines long, and marked across the thorax and abdomen with black bands and spots. The female fly hovers round the horse, and deposits her eggs, which are covered with a glutinous substance, upon the shoulders and thighs of the animal, generally in such places as it can reach with its tongue. They become mature in the course of four or five days, and when just hatched are thus conveyed into the stomach, where they remain till they reach their full size. Horses having these insects are said to have the "bots;" and some authors assert that their presence does not incommode the horse at all, but, on the contrary, has rather a beneficial effect. Others, however,

maintain that they are very injurious, and assert that the epidemic which destroyed so many horses in France, in 1713, was caused by these insects. The species which affects the sheep, *Oestrus ovis*, lays her eggs in the nostrils of that animal. As soon as they have become larvæ, they burrow into the frontal and maxillary sinuses, and even into the horns, and cause great suffering to the poor creatures. The species which infests oxen, *Oestrus bovis*, is about the size of the common bee, and is well known by the name of the gad-fly. The female deposits her eggs on the backs and sides of cows and oxen, the larvæ produced from which enter the hide, causing tumours the size of a pigeon's egg. This species seems to produce more annoyance than either of the others. The act of oviposition appears to be attended with either severe suffering or great apprehension, as when attacked by this fly, cattle become perfectly furious. Terror and agitation seem to affect the whole herd. The unfortunate individual first attacked flies bellowing from the rest of the flock, and takes refuge in the nearest piece of water, while the remainder, in a state of wild affright, follow in its rear, and chase round the whole meadow with headlong speed. The gad-fly of the reindeer, *Oestrus tarandi*, is equally



Oestrus tarandi—Gad-fly of Reindeer.

formidable to that useful animal. Reindeer are well known to be migratory in their habits, herding in troops, and travelling from the woods to the open hills, and back again, according to the season. They pass the winter in the woods, migrating from them, on the return of spring, towards the mountain ranges. This appears to be caused partly for the sake of obtaining proper food, but more especially in order to escape the attacks of this dreaded pest, the gad-fly. So imperative is the instinct that impels the Lapland reindeer to these migratory movements, that it is equally powerful with the domestic race upon which the Laplander so much depends for existence, and which influences even his whole course of life, obliging him to lead a semi-nomadic life, taking periodical journeys of no ordinary toil, from the interior of the country to the mountains which overhang the Norway and Lapland coasts, and back to the interior.

Ogygia.—A genus of fossil *Crustacea*. See TRILOBITE.

Oidemia.—A genus of ducks. See ANATINÆ.

Oidium.—A genus of minute *Fungi* belonging to the family *Mucedines*, and generally described as perfect plants, though, perhaps, they are for the most part only imperfect conditions of plants of a more complex nature. One species has of late years attracted much attention, from the immense destruction it has been the cause of amongst the vines. This fungus, *O. Tuckeri*, the vine mildew, as it ordinarily appears, forms a white and very delicate cottony layer upon the leaves, young shoots, and fruits of the vine, soon causing a production of brown spots upon the green structures, and subsequently a hardening and destruction of the vitality of the surface. Under the microscope, this white substance is seen to be composed of delicate ramified filaments, creeping horizontally over the surface, and when the plant is much developed, forming a dense interlacement. The destructive effect of this fungus seems to arise from its arresting the development of the epidermis, by binding its structures together, and excluding the surface from the influence of the air, since when young grapes are invaded, the internal development proceeds, but the sphacelated epidermis prevents the natural expansion, they burst and rot. When the mildew is observed with a low magnifier, its surface exhibits a mealy appearance, arising from minute bead-like or pearly shining bodies of an oval form. The application of sulphur appears to arrest the growth of this fungus. Another species, *O. lactis*, is found on sour milk, and a third, *O. albicans*, is found occasionally in the mouth of the human subject.

Olea. *The Olive Tree.*—See OLEACEÆ.

Oleaceæ. *The Olive Worts.*—An nat. ord. of dicotyledonous plants, consisting of a considerable number of trees and shrubs, chiefly scattered over the temperate regions of the world, more especially in the northern hemisphere. Their leaves are for the most part, opposite, entire, and simple a few only being pinnate. Their flowers are not very conspicuous, but are often possessed of a agreeable and penetrating odour, from which, as well as from their general elegance, they are often cultivated as objects of ornament to the park and garden. The wood in some of the species is very hard and useful for various purposes. There are several well known trees and shrubs belonging to this family—as the ash tree, see FRAXINUS and ORNUS; the lilac, see SYRINGA; the privet, see LIGUSTRUM; and the fringe-tree, see CHIONANTHUS. The genus *Olea*, however, is the type of the family, and contains a good many species which are scattered over the countries bordering the Mediterranean, and are also found in tropical Asia, the extra-tropical parts of Australia, at the Cape of Good Hope, and, though rarely, in North America. The leaves of the olives are entire coriaceous, and the flowers are small, white, or

yellowish, and generally exhale a sweet odour. The best known and most important species of the genus is the well known and valuable olive tree, *Olea Europœa*. The olive tree is originally

Olea Europœa—The Olive tree.

a native of Syria, Persia, and Arabia, and was transported from Asia into Greece at a very early period. It is now cultivated in all parts of the south of Europe, and forms an object of great commercial value. In its native wild state, it is an evergreen shrub, or low tree, tortuous and irregularly branched, with spiny stems, and a small fruit; but in its present cultivated state it forms a tree of considerable size, with a rounded head, a stem six or nine feet high, and of great thickness, and a large oily fruit. It is very long lived, and in a state of cultivation shows a considerable number of varieties, each of which is more or less easily distinguished from the others, and has peculiar qualities. The great value of the olive tree depends upon its fruit. This is always very bitter and rough to the taste; and to render it fit for table, it is submitted for two or three hours to the action of a strong ley. After that it is steeped in fresh water for two or three days, and then salted for use. The oil obtained from it, however, is of more importance than its use for the table. This abounds in the pericarp, and not in the nut. The finest kind of oil, called virgin oil, is obtained merely by expression. The common olive oil is procured by a stronger amount of expression, and submitting the fruit to the action of boiling water. The best kind of oil is obtained from Provence and Florence. Olive oil is the principal article of export from the kingdom of Naples. Apulia and Calabria are the provinces most celebrated for its production. The largest portion of the oil brought to this country, however, is from Italy, chiefly from Gallipoli. The harvest takes place in November and December. Olive oil has two principles—margarine and elaine—and possesses nutrient, emollient, and laxative properties. It is very much used in the manufacture of soap, and in the woollen manufacture. The bark of the olive tree has been used as a tonic, and a resinous exudation from it, called olivile, olive-gum, or lecca-gum, is employed in the same way. The wood is hard, veined, and susceptible of a good polish. It is accordingly used by cabinet-makers; and the ancient carvers used to prefer it for their purposes to all other kinds of wood. The crown of the victor in the Olympic Games, in honour of Jupiter, was made of the leaves of the olive tree. The olive tree is attacked by some kinds of insects, two species in particular, in certain seasons, causing great destruction to the crops. One of these is a lepidopterous insect, *Tinea Olœlla;* and the other a dipterous insect, *Oscinis* (*Dacus*) *Oleœ*. A species of olive tree, *Olea Americana*, is found in America, growing in the southern parts of the United States. It reaches the height of from thirty to forty feet, and has long, oblanceolate, coriaceous leaves, of a fine, showy, green colour, and small, but very sweet smelling flowers. The wood is so hard and difficult to work, that the Americans call it *Devil-wood*. *Olea fragrans* is a native of China, where it is known by the name of *Lanhoa;* and the flowers are used by the Chinese to perfume teas.

Oleander.—A genus of plants. See APOCYNACEÆ.

Olibanum. *Frankincense.*—A resin. See AMYRIDACEÆ.*

Oligiste.—A variety of specular iron ore.

Oligon Spar.—An isomorphous variety of spathic iron, composed of carbonate of iron and carbonate of manganese, and found at Ehrenfriedersdorf.

Oliva. *The Olive Shell.*—A genus of gasteropodous *Mollusca* belonging to the tribe *Edriophthalma*, and forming the type of the family *Olividæ*. The shells are cylindrical, smooth, and polished. The spire is short, and channelled round the suture, in which a filiform process of the mantle of the ani-

mal lies. The opening is long, narrow, and notched in front, and the columella is striated obliquely. The animal has a large foot, into which the shell is sunk, so that only a small portion of it is visible when the animal is walking. This foot often covers the shell, and produces a polished coat on it. Nearly 120 species have been described, natives, for the most part, of sub-tropical seas; and about twenty species are found fossil in the eocene formations. The olives are carnivorous, voracious, and very active. They bury themselves in the mud, in order to prey upon bivalve molluscs, which form their chief food.

Olivane.—A variety of *Chrysolite*, of an olive colour, and found common in basalts and lavas.

Ommastrephes (*ομμα*, the eyes; *στρεφω*, to turn).—A genus of cephalopodous *Mollusca* belonging to the family *Teuthidæ*, and nearly allied to the genus *Loligo*, but differing in their eyes being naked, instead of being covered with a skin. The terminal fins are large, of a rhombic shape; and the species are known by the name of sagittated calamaries. They are gregarious, and frequent the open sea in all climates. They are extensively used in the cod fishery off Newfoundland, and are the principal food of the dolphins and cachalots, as well as of the albatross and larger petrels. The sailors call them "sea-arrows," or "flying squids," from their habit of leaping out of the water, often to such a height as to fall on the decks of vessels. They leave their eggs in long clusters floating at the surface. About fourteen species are known, three of which are natives of Great Britain.

Omphalobium.—A genus of plants. See CONNARACEÆ.

Onagraceæ. *The Evening Primrose family.*—A nat. ord. of dicotyledonous plants, containing many species, chiefly herbaceous, rarely shrubby, scattered over all the temperate regions of the northern hemisphere, and especially abundant in America. They possess no active properties, but abound in a mucilaginous juice, with which, in some species, is mixed an astringent principle. Some of them have sweet smelling flowers, and many are beautiful and handsome ornamental plants in cultivation. Such are the genera FUCHSIA, EPILOBIUM, and *Oenothera*. This latter genus may be taken as the type of the family, and it contains many species. They are all herbaceous plants, growing chiefly in North America, and possessing very pretty flowers, of considerable size, and various in colour. *Oenothera biennis*, the common evening primrose, is one of the best known species. It is said to be a native of Virginia, but is now so common in many parts of Europe as to appear to be truly indigenous. It is very common in some parts of Lancashire and Sussex. It is a fine, large plant, with a rough stem, and handsome, large, yellow flowers. The roots are eatable, and were formerly taken after dinner to flavour wine, as olives now are; hence its name, *Oenothera*, the wine-trap. In some parts of Germany the young shoots and roots are used as salad.

Onchidium.—A genus of orchideous plants, one species of which is called the butterfly plant, *O. papilio*, from the resemblance the flower bears to a butterfly.

Ondatra. *The Musquash.*—A genus of rodent *Mammalia* belonging to the family *Castoridæ*, and containing only one species, the musquash, musk beaver, or musk rat, *O. zibethicus*. It is a native of North America, its habits and appearance are somewhat similar to those of the beaver, and it is hunted for its skin, which is used in the manufacture of hats. Upwards of a million of skins are said to be imported into this country annually.

Oniscidæ.— } A family and genus of *Crus-*
Oniscus.— } *tacea*. See ISOPODA.

Onobrychis (*ονος*, an ass; *βρυχω*, to gnash the teeth).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Papilionaceæ*. About forty species are described, the most common of which is the sainfoin, *O. sativa*, which is a native of Britain, and used as food for cattle.

Ononis (*ονος*, an ass; *ονημι*, to delight). *The Rest-Harrow.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Papilionaceæ*. The species are numerous, but none of them are of much value in medicine or the arts. They are chiefly herbaceous or slightly shrubby plants, most of them natives of Europe. Their leaves are pinnate, and their flowers are yellow or purple. Two or three are natives of Great Britain. In the time of flowering, the roots of *O. arvensis*, the trailing rest-harrow, have the taste of liquorice, and hence in many parts of the country this species is known by the name of wild liquorice.

Onopordum.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and containing amongst other species one, *O. Acanthium*, the cotton thistle or wild artichoke, which is a native of Great Britain. It is a plant which grows from four to five feet high, and the stem is woolly with broad spinous wings. The fleshy receptacle was at one time used as an esculent, in the same way as the artichoke is, and the expressed juice of the plant has been said to be a serviceable application in cases of cancer, and to cleanse foul ulcers. The seeds abound in oil, and 3 lbs. of oil fit for burning have been obtained from 12 lbs. of seeds.

Onychoteuthis (*ονυξ*, claw; *τευθις*, cuttle-fish). *Uncinated Calamary.*—A genus of cephalopodous *Mollusca*, belonging to the family *Teuthidæ*, and distinguished from the others of the family by their tentacles being long and powerful, and armed with a double series of pretty strong hooks. They are solitary animals, frequenting the open sea, and especially the banks of gulf weed. Some of them reach a large size.

Onyx.—A mineral substance. See AGATE.

Oology (*ωον*, egg; *λογος*, a discourse).—That branch of natural history which treats of the eggs of birds.

Opal.—A mineral, including several varieties, all siliceous, possessed of some transparency, but rendered in some measure opaque by a different colour floating, as it were, in the stone. *Common Opal* consists of silica 20·, water 1·125, and its specific gravity is from 2·015 to 2·21. It is either milk-white or of various shades of colour, as yellow, brown, red and green. *Precious Opal* consists of silica 90, water 10; and exhibits a beautiful play of colours, of blue, green, yellow, and red, when held in the light. It is chiefly found in Hungary. *Fire Opal* occurs with this last, and the play of colours exhibited by it is red. Various other kinds are known, as the *semi-opal*, the *wood opal*, mother-of-pearl *opal*, and *opal jasper*, &c.

Opalina.—A genus of minute parasitic animals found in the intestines of frogs. It is by most writers referred to the class *Infusoria*.

Operculina.—A genus of minute animals belonging to the class *Rhizopoda* or *Foraminifera*, in which the shells are discoidal, and the spire visible on both sides.

Operculum (*operculum*, a lid).—In conchology, this term is applied to a calcareous or horny substance secreted by the foot of many of the gasteropodous *Mollusca*, and which, when the animal withdraws within the shell, closes the aperture. By some conchologists it is considered as the analogue of the right valve of the *Conchifera*. An operculum, however, is found also closing the mouth of the calcareous tubes of some of the *Annelida*, as the *Serpulæ* and *Spirorbis*, &c.

In Botany, the word *Operculum* is chiefly used to designate the cap or lid which covers the top of the theca or spore-case, in mosses.

Ophelia.—A genus of *Annelides* belonging to the family of *Nereids*. They have no antennæ or dorsal cirrhi, but have a ventral cirrhus on a certain number of the rings in the centre of the body. The species forming the genus were found at Rochelle.

Ophicephalus (*οφις*, a serpent; *κεφαλη*, head).—A genus of fishes, the species of which have no spines in the fins, except a short one on the first of the ventrals, and can live a long time out of water. See ANABASIDÆ.

Ophidia (*οφις*, a serpent; *ειδος*, form.) *Serpents.*—An order of animals belonging to the class *Reptilia*, characterized by the total absence of limbs, or when present being only in the form of short spurs on the side of the vent. Their mouths are capable of being opened very widely, in consequence of the bones of the jaws being separate from each other, to enable them to swallow large bodies entire. Their bodies are always of a more or less cylindrical form, and their head generally of about the same size as the body. Having no legs, their motion on the ground is by creeping in a sinuous manner. The body is covered with a scaly epidermis, and their skin is capable of a certain amount of extension. Serpents are generally divided into two large groups, *the Poisonous*, and *the Harmless Serpents*. The first group, *Venenosa*, have their upper jaws furnished with large moveable fangs, having a small groove on the outer convex edge, for conveying the poison, secreted by a large gland placed under the eye, into the wound occasioned by the bite of the reptile. The fangs, when at rest, are hid by a fold in the gums, and behind them are the rudiments of other fangs, to replace the former, if lost. This group contains the rattlesnakes, CROTALIDÆ, and the vipers, VIPERIDÆ. The second group, *Innocua*, have strong jaws, both of them furnished with one or more series of teeth. They are in general innocent; a few have some of the upper lateral teeth rather larger than the rest, and grooved on the hinder edge, the groove communicating with a gland placed on the side of the face, but their bite is seldom so dangerous as that of the eminently poisonous snakes. To this group belong the COLUBRIDÆ, the BOIDÆ containing the boas and pythons, and the sea snakes, HYDRIDÆ.

Ophiocoma.—A genus of *Echinodermatous* animals belonging to the family *Ophiuridæ*, and containing those species of star-fishes called brittle-stars, from their extreme fragility.

Ophioglossum (*οφις*, a serpent; *γλωσσα*, a tongue).—A genus of acotyledonous plants belonging to the nat. ord. *Filices*, and containing amongst others one species, *O. vulgatum*, which is common in many parts of Great Britain, and is known by the name of adder's tongue. This fern is from four to twelve inches high, and in some parts of the country the green leaves are used to make an ointment for healing wounds.

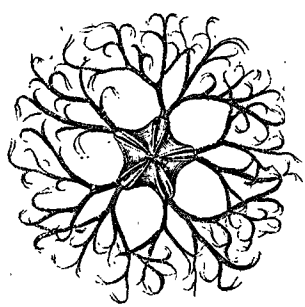
Ophiosoma.—A genus of star-fishes. See OPHIURIDÆ.

Ophisaurus (*οφις*, a serpent; *σαυρος*, a lizard).—A genus of reptiles belonging to the family *Zonuridæ*. The only species known is the glass snake, *O. ventralis*, a harmless serpent-like creature, found in the Southern United States of America. It is quite destitute of legs. The body of this animal is so exceedingly brittle that a slight blow with a stick will cause the body to separate, not only at the place struck, but at two or three other places.

Ophiura.—See OPHIURIDÆ.

Ophiuridæ (*οφις*, a snake; *ουρα*, a tail).—A family of animals belonging to the great class *Echinodermata*, and known by the name of lizard-tailed star-fishes. The animals composing this family have a more or less orbicular depressed body, with five cylindrical, jointed, very flexible arms, which are sometimes very long, and repeatedly divided into branches. These

rays or arms are scaly, like the tails of serpents or of lizards, and are very fragile. They have no gutters or grooves underneath, and, consequently, no tentacula. Their motion, therefore, is different from that of the true star-fishes. When they move, the animals employ the two arms nearest the point to which they wish to go, and the one farthest from it. The two first, curving at the extremities, form two hooks directed outwardly, which applying themselves to the sand, draw the body forwards, whilst the posterior arm is curved vertically, and pushes the animal along. They live exclusively in sandy shores, and hide themselves in the mud at the least appearance of danger. If they lose their arms, they are able quickly to renew them; and, during summer, a few days suffice to replace their loss. The young are in the form of small ciliated animals, which have been described as a genus of animalcules, under the name of *Pluteus*. They are found in abundance in the open sea, on the surface, swimming by means of the vibratile cilia, particularly those with which their appendages are furnished. They undergo considerable changes or metamorphoses during their progress to maturity. The *Ophiuridæ* are numerous in species, and are arranged under a considerable number of genera. The true *Ophiuræ*, such as the genera *Ophiura* and *Ophiosoma*, have the body covered with spines or scales, and the arms, which are always simple, furnished with cross series of spines on the sides, in the latter being long and expanded, and in the former short and appressed. The animals belonging to the genus *Euryale* have the body covered with a leathery skin, and strengthened behind with five pairs of radiating ribs. In *Astrophyton*



Astrophyton.

the arms are repeatedly branched, so as to end in very small flexible filaments, by which the animal attaches itself to marine bodies, and strains its food from the surrounding water. From this extraordinary branched disposition of the arms, the species are called *Medusa heads* or *Gorgon heads*.

Ophrys. — A genus of monocotyledonous plants belonging to the nat. ord. *Orchidaceæ*, containing a number of species of herbaceous plants with tuberous roots, and natives of Europe. They differ from the ordinary species of the genus *Orchis*, from the flowers being in the form of insects. One of the species, a native of Britain, has its flowers resembling a bee, hence it is called *O. apifera*. Three other species are natives of Great Britain. They are interesting plants, but difficult to cultivate.

Opilus.—A genus of beetles. See CLERIDÆ.

Opis.—A genus of fossil shells belonging to the class *Conchifera*, and family *Cyprinidæ*. The shell is strong and heart-shaped, with prominent incurved beaks. Upwards of forty species are known, chiefly from the chalk formation.

Oplotherium (ὅπλον, defensive armour; θηρίον, animal).—A genus of fossil pachydermatous animals, having the canine teeth more prominent than any of the others. It was found in the tertiary rocks in the basin of Allier.

Opocephali.—A genus of monsters. See OTOCEPHALÆI.

Opoponax. — A genus of dicotyledonous plants, belonging to the nat. ord. *Umbelliferæ*. From the root and stem of one of the species of this genus, *O. chironum*, is obtained the gum resin known by the name of opoponax. The plant is a native of the south of Europe and Asia Minor, is about six or seven feet high, and resembles very much the parsnip. The gum is brought to this country from the Levant in roundish drops of a reddish-yellow colour, with specks of white. In its effects upon the human system, the opoponax is similar to assafœtida.

Opuntia.—A genus of dicotyledonous plants containing several species known by the name of prickly pear, &c. See CACTACEÆ.

Orbicula.—A genus of molluscous animals belonging to the class *Brachiopoda*, and family *Discinidæ*, and synonymous with the genus *Discina*. Only a few (seven) species are known in a recent state, but a good many are found fossil, in the silurian formation. The shells are orbicular, consisting of two valves, the inferior one being very slender, flat, with a sunk and perforated disc on the posterior side, and the superior valve being conical, patella shaped, smooth, or concentrically lamellose. The animal has the two lobes of the mantle distinct all round, and edged with fine, unequal, horny cilia. The foot passes through a cleft in the inferior valve, to attach itself to rocks or other marine bodies. The two oval arms are pretty large, spirally twisted, but not projecting externally. Two or three of the species are natives of the North Sea, and two or three others of South America.

Orbiculina.—A genus of animals belonging to the class *Rhizopoda* or *Foraminifera*, consisting of several species of minute chambered shells. *O. numismalis* is the type, and is found living in the West Indian seas.

Orca.—A species of dolphin. See DELPHINIDÆ.

Orchestes (ορχηστης, a leaper).—A genus of tetramerous *Coleoptera* belonging to the family *Curculionidæ*, and having the power of leaping to a considerable height when they feel themselves in danger. Thirty or forty species are known, most of them European, though a few are from North America. They are small insects which feed upon the leaves of trees.

Orchestia (ορχηστης, a leaper).—A genus of *Crustacea*, belonging to the order *Amphipoda*. The species are similar in their habits to those of the genus TALITRUS, and are found in the Mediterranean and Atlantic Oceans, the Red Sea, the coasts of South America, and New Zealand.

Orchidaceæ. *The Orchis family.*—A nat. ord. of monocotyledonous plants, containing a very large number of species (upwards of 3,000 have been described), of beautiful and extraordinary looking plants, which have created a great degree of interest in travellers and collectors. In their inflorescence, the species of the family have all a striking general resemblance, but their method of growth varies considerably. They are almost all herbaceous, a very few only being somewhat shrubby in their growth. Some live in the ground, and besides the ordinary fibrous roots have bulbs, or starch-bearing tubercles.

Tubercular Root of Orchis.

Others are what may be called pseudo-parasites, living attached to the bark of trees. These plants abound in the forests of tropical countries where the climate is moist, and are generally known by the name of EPIPHYTES. The flowers vary very much in shape, form, and colour, and in many instances have a strong resemblance to insects, various birds, and animals, as ONCIDIUM, in which the resemblance is to butterflies, &c.; *Cychnoches*, in which (in one species) the likeness is strikingly similar to a swan; *Peristeria*, one species of which is called the spirito-santo plant of Panama, and in whose flower there is the likeness of a dove in the act of descending upon the lip, &c., &c. A curious fact in this part of their history is, that in the same plant, on the same stem, and even on the same head of flowers, we find flowers so different in appearance that we might place them in different genera. The *Orchidaceæ* are natives of almost all parts of the world, but chiefly in warm climates. *Disa grandiflora* is found on Table Mountain at an elevation of 3,582 feet. *Oncidium nubigenum* is found on the Andes, near Quito, at an elevation of 14,000 feet above the level of the sea. *Epidendrum frigidum* occurs in Columbia at an elevation of 12,000 to 13,000 feet (mean temperature 46°). There are very few species of orchidaceous plants that are of any great economical value. The substance known as vanilla, and used in confectionery and in flavouring chocolate, is obtained from the fleshy pod-like fruit of *Vanilla planifolia* and *claviculata*. The nutritious substance called salep is procured from the tuberous roots of several species of the genus *Orchis*, though the particular species do not seem well known. The greater part used in this country is imported from India and Persia. A blue colouring matter has also been obtained from some of the species of orchids. But though their economical uses are not sufficient to make these plants of much importance, at present they constitute an article of considerable commercial value. Their beauty, rarity, and extraordinary method of flowering have caused them to be very much cultivated, and led to the importation of great

Phalænopsis amabilis.

quantities. The species we have selected as an illustration is *Phalænopsis amabilis*, a native of Java, with large white flowers, and very fragrant. On the island of Ternate we are told that none

but princesses are allowed to wear this precious flower. In consequence of the immense increase of species of late years, the orchids have been divided into seven tribes or sub-orders—as *Malaxideæ*, *Epidendreæ*, *Vandeæ*, *Ophrydeæ*, *Arethuseæ*, *Neottieæ*, and *Cypripedieæ*.

Orchis.—The genus *Orchis* gives its name to the above mentioned family, but it has been so much restricted of late that it now contains but comparatively few species. They are all terrestrial, natives of the Old World, and live in temperate, or even rather cold climates. Their roots are furnished with two tubercles, either ovoid or palmate, and the leaves are chiefly radical and thickish. The flowers are terminal. Several species are natives of Great Britain. *O. maculata* is one of the most common. The tubercles in it are palmate. *O. morio* has the tubercles nearly globular and undivided. It is from the tubercles of these plants that it is said salep is obtained. In the East this substance is used as an article of food, but in Europe it is employed more as a medicinal agent for invalids. In Persia, where great quantities are made, it is prepared by pouring boiling water over these tubercles in order to remove the outer skin. They are then exposed to the sun and air to dry, and in this state will keep a long time.

Oreas.—A genus of mammalia. See STREPSICERÆ.

Oreotragus.—A genus of antelopes. See ANTILOPEÆ.

Oribatidæ.—A family of acari. See ACARIDÆ.

Origanum.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing several species of herbaceous or somewhat shrubby plants, inhabiting the regions about the Mediterranean, the central parts of Europe and Asia, and some of the mountains of Upper India. They possess entire or slightly dentate leaves, and flowers in cylindrical or oblong panicles, and accompanied with coloured bracteæ generally longer than the calyx. *O. vulgare*, or common marjoram, is common in Great Britain, and other parts of Europe, and is remarkable for its very agreeable aromatic scent and bitter taste. By distillation an essential oil is obtained from it which is sold in the shops as oil of thyme. Mixed with olive oil it is used as a stimulating liniment against baldness, in rheumatism, and against strains and bruises. In France it is employed by physicians in cases of catarrh, accompanied with a congested state of the lungs.

Oriolus.—A genus of birds. See TURDIDÆ.

Ornithichnites.—Footmarks have frequently been observed impressed upon the surface of sandstone rocks. These have been ascertained to be the footmarks of birds, and this name has been applied to them generally.

Ornithogalum (ὄρνις, a bird; γαλα, milk).—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, and containing several species growing chiefly in the parts of Europe bordering upon the Mediterranean, and at the Cape of Good Hope. Three or four are indigenous to Great Britain, or are cultivated in our gardens. *O. umbellatum* is one of these, and is known in this country by the name of Star of Bethlehem, and in France by that of "Dame d'onze-heures," because it rarely flowers till towards mid-day.

Ornitholithes (ὄρνις, a bird; λίθος, a stone).—A name applied in general to the remains of birds found fossil. As the teeth are totally wanting in birds, and the osteological characters of that class of animals are not so well known as in the class of *Mammalia*, it is often difficult to determine the relation of the fossil bones found, with the existing genera. Some have been well distinguished, as the DINORNIS, &c. Others are only known by their footmarks, as *Cheirotherium*.

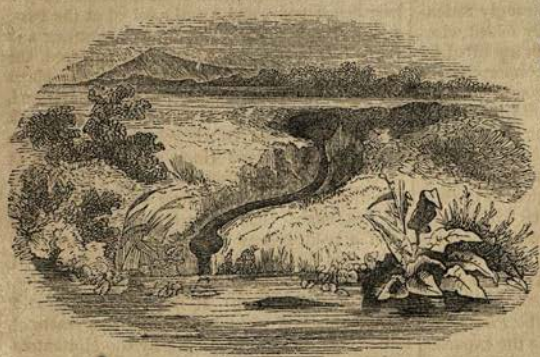
Ornithologia (ὄρνις, a bird; λογος, a discourse). *Ornithology.*—That branch of natural history which treats of the habits and classification of birds.

Ornithorhynchus (ὄρνις, a bird; ρυγχος, a beak).—A genus of animals belonging to the class *Mammalia*, order *Ungulata*, and family *Dasypidæ*. It is also called *Platypus*, and along with the genus ECHIDNA, they form the sub-family *Ornithorhynchinæ*. In some systems of zoology these two genera form a separate order, the *Monotremata*. See MARSUPIALIA. This genus contains only one species, *O. paradoxus*, a native of Australia, the duck-billed platypus, the mullingong of the natives, or water mole of the English settlers. This animal is about twenty inches long, with a flattened body like that of the otter, covered with a thick, soft fur, of a moderately dark brown olive, and whitish beneath. The jaws are enveloped in a horny sheath, and are very similar in appearance to those of a duck or goose. The eyes are small but brilliant, and the ears have no external appearance, but the aperture can be closed or opened at pleasure. The feet are short, project laterally, are webbed, and furnished with strong claws. In the fore feet, which are the stronger, the web extends beyond the claws, is loose, and falls back when the animal uses its feet to burrow. The hind feet are armed with a sharp tubular spur, which communicates with a gland that secretes a peculiar fluid. The genital and urinary organs open externally by the same orifice. Many authors deny the existence of true mammæ in the ornithorhynchus, but the researches of the most recent anatomical zoologists prove that these organs do exist, and secrete true milk. It appears also from these writers that the females are viviparous and not oviparous, as was at one time alleged. Their jaws have no teeth, these organs being replaced by horny tubercles, two in each jaw on each side. When laid

hold of, they attempt to bite, but their flexible beak and want of teeth prevent them doing much harm. The formation of the limbs enables these animals to swim well, and accordingly we find they live a good deal in the water, though they cannot remain long submerged, but require to come frequently to the surface to breathe. They are able, also, to walk tolerably quick on the ground, and they scratch themselves with their hind legs as dogs do. They excavate burrows on the banks of the rivers and lakes in which they reside, and the female deposits her

Ornithorhynchus.

young in a kind of nest formed at the bottom. The ornithorhynchi live upon worms, insects, and small aquatic animals which they seek for in the mud, much in the same manner as ducks and geese do. The spur on the hind leg is said by some naturalists to be used as an organ of de-



Burrow of Ornithorhynchus.

fence, and the secretion of the gland with which it is connected, is considered poisonous. Others, however, assert that this is not the case, but as it is only found in the male, that it is used by him to retain his hold of the female.

Ornus. *The Flowering* or *Manna Ash.*—A genus of dicotyledonous plants belonging to the nat. ord. *Oleaceæ*, and sub-order *Fraxineæ*. The species were formerly contained in the genus *Fraxinus*, to which they are very closely allied. There are only a few species known. The common manna or flowering ash, *O. Europæa*, is a small round headed tree, growing in the southern parts of Europe, especially in the woods of Calabria and Upulia. In the summer, when the leaves are full grown, the trees become ornamented with a profusion of white delicate blossoms, which give them a strikingly beautiful appearance, and furnish them with one of their common English names. There is another species growing in the same localities, *O. rotundifolia*; and both these trees produce the sweet laxative substance well known as *Manna*. It is secreted by the leaves and branches, and oozes out either by artificial wounds or the puncture of an insect. Manna is a very sweet substance, but it does not owe its taste to sugar, but to a peculiar principle called *Mannite*.

Orobanchaceæ (ορόβος, a kind of vetch; ἀγχω, to strangle). *The Broom-Rape family.*—A nat. ord. of dicotyledonous plants, growing parasitically upon the roots of other species, and

found in the temperate parts of the northern hemisphere. They are peculiar looking plants, being destitute of true leaves, but furnished instead with scales. At one time they were used in medicine, under the idea that such singular plants must contain particular virtues. The genus *Orobanche*, or broom rape, is the type, and the largest and best known species is the greater broom rape, *O. major*. It grows parasitic upon broom, furze, and other shrubby and leguminous plants. It is very bitter, and possesses strong astringent qualities. A good many other species are found in Great Britain, and agriculturists affirm that they are injurious to their crops of clover, &c.

Orobus.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, and containing a number of species of herbs with training stems, and smooth pinnate leaves. *O. tuberosus*, the tuberous bitter vetch, is one of the most common species. It has a winged stem, and a fibrous root, which swells out at irregular intervals into tubers as large as a nut. The plant is a native of Britain, and the tubers when boiled are edible, and have been used in times of scarcity as an article of food. In the Highlands of Scotland the inhabitants distil an agreeable fermented liquor from them. The plant itself is eaten by cattle.

Orthoceras.—A fossil genus of cephalopods. See NAUTILIDÆ.

Orthoclase, or **Orthose.** — A variety of felspar. See FELSPAR.

Orthoptera (ὀρθός, straight; πτερόν, a wing). —An order of insects characterized by their anterior wings being semi-coriaceous, thickly veined, and overlapping at the tips; and the posterior wings being membranous, large, strongly reticulated with veins, and longitudinally folded when at rest. The organs of the mouth are fitted for triturating solid bodies. The metamorphosis of these insects is incomplete. The young resemble the parent except that they have no wings. Before they get these organs they undergo several changes of skin. After the fifth moult, the wings appear, but they do not assume the perfect state till after the sixth. In their wingless form they are in the state of larvæ; when the wings have made their first appearance they are in the state of nympha, and when the wings are perfected they are in the state of imago. The orthoptera are insects which attain a greater length than in any of the other orders, several of the *Phasmidæ* being ten inches long, and as much in the expanse of their wings. Many of the genera assume grotesque forms, some resembling dried sticks, and others assuming the exact appearance of leaves, hence they are called "walking sticks," and "walking leaves." The order contains fewer species than almost any other; though some of them occur in immense numbers, and are capable of doing great injury. In general they are herbivorous, though some, as the *Blattæ*, are omnivorous, and others, as the *Mantis* genus, are carnivorous. They exist in all parts of the world, though they are most abundant in warm countries. To the order orthoptera belong the cockroaches or black beetles, BLATTIDÆ, the MANTIDÆ, the PHASMIDÆ; the crickets, ACHETIDÆ; the grasshoppers, GRYLLIDÆ; and the locusts, LOCUSTIDÆ.

Orthotomus (ὀρθός, straight; τομή, section). —A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and containing three or four species, natives of India. Their beak is slender, elongated, nearly straight, a little depressed, and broad at its base. The wings are very short and rounded, and the tarsi long and slender. They live upon insects; one of them, from Upper India, upon ants. *O. sepium*, or *ruficeps*, is peculiar for the formation of its nest. It is placed artistically between two large leaves stitched together at the edges with threads of cotton.

Orthragoriscus. *The Sun-fish.*—See DIODONTIDÆ.

Ortygometra. *The Land Rail.*—See RALLIDÆ.

Ortyx. *The Colins.*—A genus of American birds related to the partridges. See PERDIX.

Orycteropus (ὀρυκτήρ, a digger; πούς, foot). —A genus of mammiferous quadrupeds belonging to the order *Ungulata*, and family *Dasypidæ*. The animals belonging to this genus are nearly allied to the ant-eaters and armadillos, but easily distinguished from the latter by the body being covered with stiff hair, and the existence, though imperfect, of a dental apparatus; the teeth, consisting of fourteen molars in the upper, and twelve in the lower jaw. These animals have a long conical head, long pointed membranous ears, a lengthened body, and a tail swollen at the base, and conical in form. The limbs are strong and short, the hinder plantigrade and five-toed, the anterior digitigrade and four-toed. The claws are very strong, thick, and much compressed. The typical species, *O. capensis*, the aardvark (earth-hog) of the Dutch colonists, is a native of the Cape of Good Hope, and is upwards of three feet in length from the tip of the snout to the root of the tail, this latter organ measuring 1½ foot more. The greater part of the body is of a reddish-gray colour, the legs and feet black, and the tail nearly white. It is a nocturnal animal, living during the day in burrows which it digs in the ground. It lives upon ants, and though this food gives its flesh a strong taste of formic acid, it is relished both by the Hottentots and Europeans, the hind quarters being especially esteemed when cured as hams. The tongue, like that of the ant-eater, is long and glutinous, by means of which, when it has quietly taken up its abode close to an ants' nest, and thrust out its tongue, the ants adhere to it, and are swallowed by thousands.

Orycterus (ὀρυκτήρ, a digger).—A genus of rats, synonymous with BATHYERGUS.

Oryx.—A genus of antelopes. See ANTILOPÆ.

Oryza. *The Rice.*—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*, the grasses, and deriving its name from the Arabic word for rice, *Aruz*. Two species have been described, but there is only one of any use, *O. sativa*, the common rice. Unlike the generality of long cultivated grains, the rice is still found growing wild in India. Rice is raised in immense quantities in India, China, and most Eastern countries, in the West Indies, Central America, and the United States. It forms the principal food of the most civilized and populous Eastern nations, and in the intertropical parts of the world occupies the same place as wheat, oats, and barley do in Europe. The best kinds of rice are brought to this country from Carolina and Patna. When in its natural rough husk, it is called *Paddy*. The chief supply to this country of cleaned rice was formerly from Carolina, but an improved method of separating the husk, which throws out the grain clean and unbroken, having been recently practised in this country, large quantities, in the rough state, are now imported from Bengal.

Oscillatoreæ.—A family of confervoid *Algæ* containing numerous minute organisms, of considerable diversity, and not very well characterized at present. The species of the typical genus *Oscillatoria* are remarkable for the extraordinary oscillating motion which they possess, and which gives them their name. The filaments wave backwards and forwards, and the broken fragments oscillate like the beam of a balance but by what means, or from what cause, is still unknown. They occur on damp ground, stones, and mud, in fresh water, running or stagnant, in springs, in brackish water, and a few are truly marine. They are of very rapid growth, and this may be readily traced under the microscope. To this family now belong a number of minute organisms which were formerly classed amongst the *Infusoria*, as for instance, *Bactrium*, *Vibrio*, and *Spirulina*, &c.

Osmerus. *The Smelt.*—See SALMONIDÆ.

Osmia (*ὀσμη*, scent).—A genus of bees. See APIDÆ.

Osmium (*ὀσμη*, smell).—A metal found existing in native *Platinum*. The oxide gives out a very disagreeable volatile odour. See PLATINUM.

Osmunda.—A genus of acotyledonous plants belonging to the nat. ord. *Filices*, containing several species inhabiting the cold and temperate regions of both hemispheres. They have clustered thecæ, arranged in a branched spike terminating the frond. One of the species, a handsome fern, *O. regalis*, the flowering fern, and rising several feet high, is a native of Great Britain.

Osphromenus (*ὀσφρησις*, nostrils; *μενη*, crescent).—A genus of fishes. See ANABASIDÆ.

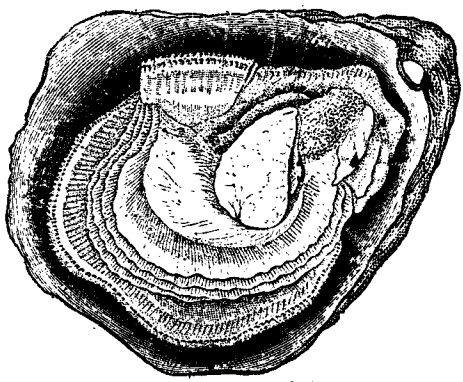
Osteolepis (*ὀς*, bone; *λεπος*, scale). *Bony Scale Fish.*—A fossil fish found in the old red sandstone, and peculiar in its general formation. The head is covered with enamelled osseous plates, and the whole body appears cased in complete armour.

Ostracion.—A genus of fishes belonging to the order *Plectognathi*, and known by the name of trunk fishes. The species are distinguished by their body being covered with an inflexible case, formed of regular bony compartments, and often armed with spines. The liver of some is large, and yields a considerable quantity of oil. They are natives of the Indian and American seas.

Ostracoda (*ὀστρακον*, a shell).—An order of entomostracous *Crustacea*. The species belonging to this order are very small, and have the body contained within a more or less opaque hard envelope, or carapace, resembling exactly the bivalve shell of a mollusc. These valves are united at about the middle third of their dorsal surface, by a ligamentous hinge, and set of muscles, so that the animals can close the valves completely, and shut themselves in entirely, or open them at will to allow the feet and large antennæ to extrude and become organs of locomotion. The feet are few in number, and are true organs of progressive motion, the branchiæ, or gills, being attached to the jaws. The antennæ are two pairs, and are used along with the feet as organs of locomotion. Some have no more than two pairs of feet, only one eye, and have a bundle of plumose hairs attached to the first pair of antennæ. These constitute the family *Cypridida*, and are all natives of fresh water. Others have three pairs of feet, one eye, and the first pair of antennæ destitute of the bundle of long plumose hairs. These form the family *Cythereidæ*, and are almost all natives of the sea. Others again have two pairs of feet, and two pairs of antennæ, but have two eyes placed upon a lengthened peduncle. These constitute the family *Cypridinidæ*, all of which are marine, and several brightly luminous at night. See CYPRIS.

Ostreidæ. *The Oyster family.*—A family of molluscous animals belonging to the class *Conchifera*, embracing several genera, some of which are fossil, and one recent containing those shells commonly known as oysters. This genus, *Ostrea*, contains about sixty species, distributed throughout the tropical and temperate seas. The best known, and perhaps the most important species of the genus, is the common oyster, *Ostrea edulis*, forming a considerable article of commerce. This mollusc is a very abundant one on the British coasts, and is generally found in banks, or beds, several fathoms under water, and often extending to a considerable distance. The time of spawning is in May and June, and the fry, which are called "spats," are collected in vast numbers, and removed to artificial grounds, or tanks, where the water is very shallow. These oysters are known by the name of "natives," and require from five to seven years to acquire their full size,

whilst the "sea oysters" are full grown in four years. The breeding and fattening oysters for the London market forms a considerable branch of business, which is principally carried on in Essex and Kent. From 20,000 to 30,000 bushels



Ostrea edulis—Common Oyster.

of "natives" are annually sent to this market; and upwards of 100,000 bushels of "sea oysters" are brought to Billingsgate from various parts. The Jersey fishery employs during the season about 1,500 men, 1,000 women and children, and 250 boats. The oyster season is from August 4, to May 12. Other species of oysters are used for the table in different parts of the world. They multiply so rapidly that in America, especially along the alluvial shores of Georgia, walls of living oysters, *Ostrea Virginica*, literally counteract the otherwise resistless force of the tide. These grow to a large size. Another species, very common in almost all warm climates, *O. parasitica*, attaches itself to the branches of trees, such as the mangrove, which dip into the water, and adhere to them in immense clusters. They are said to possess a delicious flavour. About 200 species of the genus *Ostrea* are found fossil.

Othonna.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and containing a number of species of herbaceous or somewhat shrubby plants, natives of the Cape of Good Hope. Some of them are sufficiently large and handsome to make them sought after as ornaments to the garden.

Otididæ. *The Bustard family.*—A family of birds belonging to the order *Grallæ*. The bustards are birds with a conical beak like that of the turkey, or domestic fowl, and long, partly naked legs like those of the stork. Their wings are rather short, and they are generally speaking heavy birds, and appear better adapted for moving on the ground than for flying. They run very swiftly, and their course is long continued. Their flight is equally rapid, but only adopted when compelled. They are very wild birds, and so cautious that it is difficult to surprise them. They generally live on rather elevated, dry and bare ground, and in small flocks of several together. They feed upon worms, insects, frogs, and lizards, and also upon herbs and seeds, especially in the winter season. Their flesh is good eating, and in many places much esteemed. The type of the family is the genus *Otis*. The great bustard, *Otis tarda*, is the largest land bird in Europe. It is a handsome bird, with the upper part of the body of a yellowish-brown colour, rayed with black, and the lower parts white. The male is distinguished by a bunch of long feathers on each side of the throat. The great bustard was at one time common in England, but has now become almost extinct, a very few perhaps still lingering about Salisbury Plain, and the unfrequented parts of Hampshire. It is becoming almost equally scarce in France, but is abundant in Spain and Italy, and still more so in Southern Russia and the Crimea.

Otocephalæi (*ους, ωτος*, the ear; *κεφαλη*, the head).—A family of monsters belonging to the order *Autositæ*, characterized by their having the ears brought close together, and often united on the median line. There is frequently also a malformation of some portion of the cranium, the jaws and a great part of the face being often wanting. The *Sphænocephali* have the eyes normal, and the jaws and mouth distinct, the ears only being brought together, or united under the head. The *Otocephali* have the ears united under the head, and the nose is atrophied, the integuments forming a kind of proboscis. There is only one eye, or the two are fused into one. The *Oedocephali* have no nose, the membranes only forming a kind of proboscis, and they have only one eye placed under this trunk. Beneath this again there is an aperture which represents the aperture of the ears, both united in one. They have no mouth, and only rudimentary jaws. The *Opocephali* have no nasal trunk, but in other respects resemble the last. The *Triocephali* have neither nose, mouth, nor eyes, and the head is very small, almost the only part visible being the two ears united under the head. All these cases are rare.

Otogyps. *The Sociable Vulture.*—See VULTURIDÆ.

Otopteris.—A genus of fossil ferns with simply pinnated leaves, containing several species which form a characteristic feature in the lias and oolitic formations.

Otus. *The Long-eared Owl.*—See STRIGIDÆ.

Ouralite.—Crystals of amphibole, occurring in the greenstone of Mount Oural.

Ourax.—A genus of birds. See CRACIDÆ.

Ouvirandra. — A genus of plants. See NAIADACEÆ.

Ovarium. *The Ovary.*—The organ in which the ova, or germs of the future offspring are formed and temporarily contained.

Oveæ. *The Sheep family.*—A sub-family of the large family *Bovidæ*, or hollow-horned ruminants, including the useful animals known by the name of sheep, and some allied genera. The sheep belong to the genus *Ovis*, and like all domesticated animals are subject to great variety. Several species are described, but in reality all merge into one, *O. aries*. This animal is one of those which has from time immemorial been subject to man, and the native country of which it is difficult to determine. The importance of the sheep to man cannot be over-estimated, and its value to him seems equally great in almost all countries, in every temperate climate, and in all ages, from the days of Abel, to the present time. Allusions to sheep occur very frequently in the sacred writings, and it was the custom in the East for the shepherd to lead his flock to their pasture. He gave names to them which they knew and would answer, and they obeyed his voice directing them. Upwards of thirty-three varieties have been enumerated. The moufflon, or wild sheep of Sardinia and Corsica, and the argali, or wild sheep of India and Siberia, belong to the genus *Caprovis*. The moufflon, *C. Musimon*, is about the size of a small fallow deer, and has very large horns. It is very wild, strong, and agile, and inhabits the mountainous parts of Corsica, Sardinia, Greece, &c. It is said by some naturalists to be the original of our common sheep.

Oriental Shepherds.

Caprovis Musimon.

Ovibos. *The Musk Ox.*—See BOVEÆ.

Ovipara. *Oviparous Animals.*—Animals are said to be oviparous when the ovum, or egg, is excluded from the body entire, and hatched after exclusion. Birds, and the great majority of reptiles, are oviparous.

Ovis. *The Sheep.*—See OVEÆ.

Ovoviviparа. *Ovoviviparous Animals.*—Animals are called ovoviviparous when the egg is hatched within the body, and the young is excluded alive. Some of the reptiles, as the viper and rattlesnake; the *Monotremata*, as the echidna; and the marsupial animals, as the kangaroo, are ovoviviparous animals.

Ovulum.—A genus of shells. See CYPRÆIDÆ.

Oxalidaceæ (ὀξυς, acid). *The Wood Sorrel family.*—A nat. ord. of dicotyledonous plants composed of a considerable number of species found in most climates, but more abundant in North America, and at the Cape of Good Hope. They are herbs, under-shrubs, or trees, and are often acid in their properties, whilst some yield edible roots. The genus *Oxalis* is the type, and the species belonging to it are herbs, or under-shrubs, and several are sufficiently beautiful to be esteemed by horticulturists. *O. acetosella*, the common wood sorrel, is a native of Great Britain, and many other parts of Europe. It seems to have established itself now in China, as it grows tolerably abundantly in the neighbourhood of Whampoa. It abounds in a particular acid, and from it is obtained, by chemists, the salt called binoxalate of potash, and sold in our shops as the salt of sorrel, or salt of lemons, so much employed for taking out iron moulds, or spots of ink from linen. It is supposed by many botanists to be the true shamrock of the Irish. This plant is used very much for culinary purposes in France. Some of the Cape species of *Oxalis* are handsome plants, with large, fine coloured flowers, and are very ornamental in the garden. *O. crenata*, a native of Peru and Chili, has been introduced into this country, and other parts of Europe, as affording an article of food. The root gives off a number of tubers from the size of a pea to that of a small egg. They contain a considerable quantity of fecula, and when boiled form a wholesome vegetable which has been recommended as a substitute for potatoes. Its fecundity is so great, that when planted in good soil as many as 500 to 700 tubers have been procured from one root planted. *O. sensitiva* has pinnated leaves which exhibit the same kind of irritability as the *Mimosa*, or sensitive plant. It is a native of India. Some other species of this family are worthy of notice. See AVERRHOA.

Oxycoccus (ὀξυς, acid; κοκκος, a berry). *The Cranberry.* — A genus of dicotyledonous plants belonging to the nat. ord. *Vaccinaceæ*, and formerly forming a part of the genus *Vaccinium*. *O. palustris* (*Vaccinium oxycoccus*) is the common cranberry which is used for making tarts and preserves. It is a native of Great Britain, Norway, Sweden, and Russia, &c., and considerable quantities of the ripe berries are annually imported to this country. *O. macrocarpus* is the American cranberry; the fruit is larger, but is considered of inferior quality to the preceding species, though it is exported from the United States to Britain in considerable quantity.

Oxyrhyncha.—A division of *Crustacea*. See BRACHYURA

Oxystoma.—A family of *Crustacea*. See BRACHYURA.

Oxyuris (ὀξυς, sharp; ουρα, a tail). — A genus of animals belonging to the class *Entozoa*, or intestinal worms, order *Nematoidea*, and family *Ascaridæ*. These worms are cylindrical in shape, and very slender. The head is naked, or surrounded by an expansion of the integument, and the mouth is round when contracted, and triangular when extended, and is furnished with three rounded lobes. The male is much smaller and more rare than the female. The species of *Oxyuris* are found in the lower part of the intestines of various animals. *O. vermicularis* is frequently found in the rectum of the human species, especially children, who often suffer a great deal of irritation from their presence.

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Pachiria.—A genus of dicotyledonous plants belonging to the nat. ord. *Sterculiaceæ*, sub-order *Bombaceæ*. The species are trees of considerable height, natives of tropical America, with compound leaves and large flowers. *P. insignis*, a native of Santa Cruz, but now growing also in the West Indies and Brazil, is a fine, large, handsome tree, with flowers of considerable size, and remarkable for their beauty and elegance. *P. aquatica* has a fruit like the cacao, and the seeds when roasted are eaten by the Indians.

Pachycephala (παχυς, thick; κεφαλη, head).—A tribe of entomostracous *Crustacea*, belonging to the order *Siphonostoma*, and containing those species of parasitic entomostracans which have the head broad and shield-shaped. In it are contained the genera *Dichelesthium*, *Ergasilus*, &c.

This name is also applied to a genus of passerine birds, belonging to the dentirostral tribe, family *Ampelidæ*, and sub-family *Pachycephalinæ*.

Pachydermata (παχυς, thick; δερμα, skin). —An order of animals belonging to the class *Mammalia*, and containing the *Elephants*, *Tapirs*, *Pigs*, &c., &c. See ELEPHANTIDÆ.

Pachytherium (παχυς, thick; θηριον, animal).—A genus of fossil edentate animals discovered in Brazil. Only one species has as yet been found, *P. magnum*.

Padina.—A genus of *Fuci* or sea-weeds, containing one species, *P. pavonia*, which is found in Great Britain, and consists of fan-shaped or reniform fronds, growing in tufts two to five inches high, and marked with concentric zones, the growing edge of which is rolled backward and fringed.

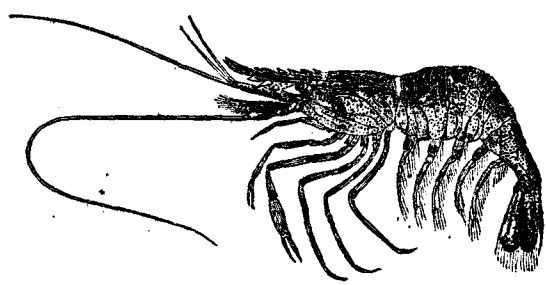
Pæonia. *The Pæony.*—A genus of dicotyledonous plants belonging to the nat. ord *Ranunculaceæ*, and forming the type of the small sub-family *Actææ* or *Pæonieæ*. There are several

species contained in the genus, and they are very generally cultivated in gardens for the sake of their large gaudy flowers. *P. officinalis* is the well known pæony rose, and is a native of the mountainous meadows of Greece, but is now cultivated in all parts of Europe as a highly ornamental plant. The root has, when fresh, a strong odour and a nauseous disagreeable taste. It enjoyed at one time an immense reputation as a medicine. The ancient physicians endowed it with supernatural powers. It was believed by them to cure epilepsy and mental diseases, to heal the severest wounds, and even to chase away evil spirits and calm tempests. A number of varieties of the pæony are now cultivated, and the only use the moderns make of this plant is to adorn their gardens with some of their most highly ornamental flowers. The moutan, *P. moutan*, is a magnificent species, a native of China. For a great number of years this fine plant was one of the most beautiful of all our flowers imported from China, and at one time some varieties fetched in Europe a very high price. It is a large shrub about nine feet high, much branched and flexuose. The flowers are large, of a rose or whitish colour, and very fragrant.

Pagellus.—A genus of acanthopterygious fishes belonging to the family *Sparidæ*, containing about a dozen species, half of them natives of European, the other half of extra-European seas. They feed upon small fishes, molluscs, &c., and live in society. *P. erythrinus*, the Spanish bream, is one of the most common species, and is of a fine carmine-red colour on the back, passing into rose colour on the sides. It is abundant in the Mediterranean, living in from fifty to sixty fathoms, and its flesh is considered good, and easy of digestion. *P. centrodontus*, the sea-bream or gilt-head, is not uncommon on the coasts of Great Britain. It is of a reddish colour tinged with gray, and marked with faint longitudinal bands which extend the whole length of the body. It is not much esteemed for the table.

Paguridæ. *The Soldier Crab* or *Hermit Crab family.*—A family of decapodous *Crustacea* belonging to the section *Anomoura*. The carapace of the greater number of the species of this family covers only the anterior and lower portion of the thorax, and is short. The abdomen or tail is greatly developed in length, is membranaceous, furnished on the upper surface with a few rudimentary crustaceous plates, and the penultimate joint is provided with a pair of hooked appendages. By means of these they closely attach themselves to the shells of various molluscs, which they afterwards occupy as their places of residence. The genus *Pagurus* is the type of the family, and contains a great many species. One of these, *P. Bernhardus*, the common hermit crab, is abundant on our coasts, and is to be found in almost every kind of whirled shell existing there. When young they may be found dwelling in small shells, such as the periwinkle, &c., but as they increase in size, they take possession of the large whelk or buccinum. They are, like most of the crustacea, carnivorous, and though they may take possession occasionally of a deserted shell, there seems every reason to believe that they attack the true inhabitant of the shell, kill it, devour it, and then usurp the place of the victim, clothing themselves with its spoils. They run about with great rapidity, and when seized, draw themselves into the shell with a sudden snap, close the aperture with their stout claws, and resist strongly all attempts to pull them out. The hermit crabs are much used by our fishermen as a bait for cod. After inhabiting the shell for some time, they are enabled by some unknown process to alter its texture to such an extent, that it becomes quite soft and can easily be penetrated by a common pin. Some species of this family form for themselves habitations in the cavities of sponges. Besides the genus *Pagurus*, the family contains the soldier crab, *Cœnobita*, and the tree crab, *Birgus*. See CRUSTACEA.

Palæmon (a mythological name). *The Prawn.*—A genus of decapodous *Crustacea* belonging to the tribe *Macroura*, and family *Palæmonidæ*, of which it forms the type. In the species belonging to this genus the carapace is



Palæmon serratus—The Prawn.

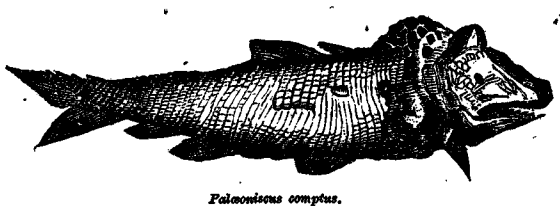
of moderate size, broad, terminating in a long, laterally flattened rostrum, which usually extends beyond the peduncles of the antennæ. Most of the prawns are small, though there are some inhabiting the tropical seas which attain a considerable size, measuring about a foot in length. Several species on our own coasts and in the Mediterranean are edible, but the common prawn, *P. serratus*, is the one which is the best known, most abundant, and by far the most

delicate as an article of food. Prawns are most frequently found in rocky parts of the coast, and in still transparent water, where they may be seen in great numbers sporting about amongst the long fuci which are found in these situations. They are sometimes taken in bag nets suspended from a circular ring of iron at the end of a pole. In many parts, however, the finest are taken in pots resembling lobster pots, but smaller and made of a closer fabric. They are found with spawn at all seasons of the year. The London market is generally supplied from the Isle of Wight and the Hampshire coast. The ordinary length is about four inches, and the colour is of a bright gray, spotted and lined with darker purplish-gray. They turn red in boiling.

Palæmonidæ.—A family of crustacea, the typical genus of which is PALÆMON, the prawns. Several other genera belong to this family, as *Hippolyte*, *Pandalus*, &c.

Palæochœrus (παλαιος, ancient; χοιρος, pig).—A genus of fossil pachydermatous animals, distinguished by having three incisive teeth on each side of the upper jaw, the front one of which is the largest, one canine, three false molars and three large molars, with a small triangular intermediate tooth. Two species have been discovered in the chalk of Indusies, in France.

Palæoniscus.—A genus of fossil fishes belonging to the order *Ganoideæ*, and family *Lepidostei*, containing a number of species, with scaly bodies, the scales of some being large, especially those in front of the dorsal and anal fins. They are found pretty equally distributed throughout the strata of the carboniferous and saliferous systems of Europe and America, and it is curious that the scales of those belonging to the coal formation are almost universally smooth, while those of the magnesian limestone are striated or sculptured.

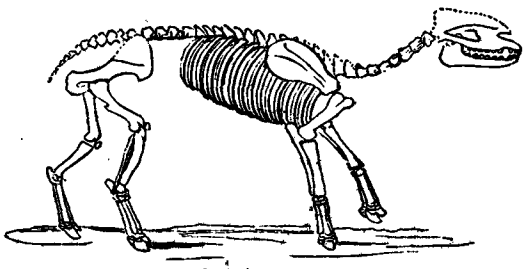


Palæoniscus comptus.

Palæontologia (παλαιος, ancient; ων, οντος, a being; λογος, a discourse).—That part of natural science which comprises a knowledge of the forms of animals which have existed in former ages of the world, and the remains of which are found in a fossil state in the different strata composing the crust of the earth.

Palæornis (παλαιος, ancient; ορνις, a bird).—A genus of parrots. See PSITTACIDÆ.

Palæosaurus (παλαιος, ancient; σαυρος, lizard.)—A genus of fossil reptiles found in the magnesian conglomerate on Durdham Down, near Bristol. This formation belongs to the oldest layers of the new red sandstone, and, therefore, this animal may be considered one of the oldest reptiles known. Two species are known.



Palæotherium magnum.

Palæotherium (παλαιος, ancient; θηριον, animal).—A genus of fossil pachydermatous animals found in the eocene tertiary beds of France, Italy, and Great Britain. This extinct genus is placed between the rhinoceros and tapir; in the toes, teeth, &c., resembling the former, and in the formation of the nasal bones, the latter, and like it, must have had a prolongation of the nose in form of a moveable trunk. A number of species have been described, some of which, as *P. magnum*, must have been nearly as large as the rhinoceros, while others, as *P. minus*, must have been about the size of a roe.

Palamedea.—A genus of birds belonging to the order *Grallæ*, forming the type of the family *Palamedeidæ*. See ARDEIDÆ.

Palapteryx.—An extinct genus of birds. See DINORNIS.

Palicourea.—A genus of dicotyledonous plants belonging to the nat. ord. *Cinchonaceæ*, and consisting of several species, natives of the West Indies and South America, shrubs five or six feet high, and possessing medicinal virtues. The plants are smooth, without any pubescence, and the flowers are yellow or white in terminal, sessile, or stalked panicles, thyrses, or cymes. Some of the species are emetic, others are diuretic, and one, *P. Marcgraavii*, is so poisonous as to be used in Brazil for killing rats and mice. From *P. tinctoria* a fine red dye is obtained, much valued in Peru.

Palinurus (a mythological name). *The Sea Craw-fish* or *Spiny Lobster*.—A genus of *Crustacea*. See MACROURA.

Paliurus.—A genus of dicotyledonous plants belonging to the nat. ord. *Rhamnaceæ*, and composed of only three or four species, which are shrubs growing in the countries bordering on the Mediterranean, in Nepâl, and Chili. *P. aculeatus* is a pretty shrub, and very common in Palestine, where it is called *Christ's Thorn*. The branches are armed with double thorns, smooth and very sharp, and it is commonly believed in the districts where it grows, that it was of this shrub that the Jews platted the crown of thorns for our Saviour. When in blossom, it is covered with small yellow flowers, and the fruit which succeeds them bears a strong resemblance to a broad brimmed hat.

Palladium.—A metal, steel-gray, inclining to white, hard, very malleable, ductile, and almost unalterable by fire. It is susceptible of a fine polish, and in that state has a splendid steel-like lustre which does not tarnish. Specific gravity from 11·8 to 12·14. Palladium has been used in making certain surgical instruments. An alloy of one part of it with six of gold, has been employed for the graduated part of the mural circle constructed for the Royal Observatory at Greenwich. It is brought from Brazil in large masses.

Pallium.—The mantle of bivalve *Mollusca*. The mark formed by it on the internal surface of the shell, is called the "pallial impression," and forms a good character in distinguishing genera and species.

Palmaceæ. *The Palm family*.—A nat. ord. of monocotyledonous plants, composed of trees which are for the most part of tropical growth, and are perennial. The total number of palms at present known and described is about 600, though it is believed that in all probability the number of existing species may not be less than from 1,000 to 1,200. Their stems are simple, rarely forked, slender, erect, and cylindrical. The leaves are generally terminal, forming a bunch or head at the summit of the tree. In shape they are pinnate or flabellate. The flowers are numerous, small, symmetrical, uncoloured or obscurely so, six-parted, and hermaphrodite or polygamous. Palms are the most graceful and picturesque, as well as some of the most majestic forms of the vegetable kingdom, many of them rising to the height of 200 feet, while others are climbers, trailing their long flexible stems over trees and shrubs, or hanging in tangled festoons between them. In the majority the stem is cylindrical, in some smooth, in others rough with concentric rings, and in many beset with spines often eight or ten inches long and as sharp as a needle. The leaves are generally large, often gigantic, in some species fifty feet long and eight wide. The fruit varies in consistence and appearance, sometimes large like the cocoa nut, but generally small compared with the size of the tree. The geographical limits of this family appear to be within 36° north latitude in America, 44° north latitude in Europe, 34° north latitude in Asia, and 38° south latitude in the southern hemisphere. In all countries where they are found they are of immense utility to the natives, scarcely a species occurring in which some useful property is not found. In South America, for instance, these trees are all in all to the aborigines. "Suppose we visit an Indian cottage on the banks of the Rio Negro, a great tributary of the river Amazon. The main supports of the building are trunks of some forest tree of heavy and durable wood, but the light rafters overhead are formed by the straight, cylindrical, and uniform stems of the tara palm (*Leopoldinia*). The roof is thatched with large triangular leaves, neatly arranged in regular alternate rows, and bound to the rafters with sipos or forest creepers; the leaves are those of the carara palm (*Mauritia Carana*). The door of the house is a framework of thin hard strips of wood neatly thatched over; it is made of the split stems of the pashiúba palm (*Iriartea exorhiza*). In one corner stands a heavy harpoon for catching the cow-fish; it is formed of the black wood of the pashiúba barriguda (*Iriartea ventricosa*). By its side is a blow-pipe ten or twelve feet long, and a little quiver full of small poisoned arrows hangs up near it; with these the Indian procures birds for food, or for their gay feathers, or even brings down the wild hog or the tapir, and it is from the stem and spines of two species of palms that they are made. His great bassoon-like musical instruments are made of palm-stems; the cloth in which he wraps his most valued feather ornaments is a fibrous palm spathe, and the rude chest in which he keeps his treasures is woven from palm leaves. His hammock, his bowstring, and his fishing-line, are from the fibres of leaves which he obtains from different palm trees, according to the qualities he requires in them, the hammock from the miriti (*Mauritia flexuosa*), and the bowstring and fishing-line from the tucúm (*Astrocaryum vulgare*). The comb which he wears on his head is ingeniously constructed of the hard bark of a palm, and he makes fish hooks of the spines, or uses them to puncture on his skin the peculiar markings of his tribe. His children are eating the agreeable red and yellow fruit of the pupunha or peach palm (*Gulielma speciosa*), and from that of the assai (*Euterpe oleracea*), he has prepared a favourite drink which he offers you to taste. That carefully suspended gourd contains oil which he has extracted from the fruit of another species; and that long, elastic, plaited cylinder, used for squeezing dry the mandiocca pulp to make his bread, is made of the bark of one of the singular climbing palms, which alone can resist for a

considerable time the action of the poisonous juice. In each of these cases, a species is selected better adapted than the rest for the peculiar purpose to which it is applied, and often having several different uses which no other plant can serve so well."—*Wallace.*

Palmacites.—A genus of fossil plants allied to the palms, only one species of which, *P. echinatus*, is known, occurring in the coal formation.

Palmella.—A genus of algæ. See THALLOGENÆ.

Palmellaceæ.—A sub-family of *Confervæ.* See CONFERVACEÆ.

Palmipedes (*palmati*, webbed; *pedes*, feet). —An order of birds; synonymous with ANSERES.

Palolo.—A genus of animals belonging to the class *Annelida*, and consisting of small worms about the thickness of a fine straw, found in the sea off the Navigator Islands. They are exceedingly brittle, and if broken into many pieces, each piece swims off as though it were an entire worm. The natives eat them, and are exceedingly fond of them. They catch them in small baskets, and when taken on shore they are tied up in leaves in small bundles, and baked.

Paludina (*palus*, a marsh). *Pond Snail.*—A genus of gasteropodous *Mollusca*, forming the type of the family *Paludinidæ*. The species are found, in fresh water and are numerous, upwards of sixty having been described. The shells are for the most part conical in shape, with a rounded oval mouth and an orbicular horny operculum. The sexes are separate, and in some of the larger species the eggs are hatched in the oviduct of the female. About fifty species have been found fossil in the wealden.

Paludinidæ.—A family of gasteropodous *Mollusca* composed of shells which are found inhabiting fresh or brackish waters in all parts of the world. The genus PALUDINA gives its name to that family, but there are others contained in it besides. The genus *Ampullaria* is by many conchologists placed here, though by others it forms the type of a distinct family by itself—see AMPULLARIIDÆ.

Panax (πανακης, something which cures all disorders).—A genus of plants containing the ginseng. See ARALIACEÆ.

Pancratium.—A genus of monocotyledonous plants belonging to the nat. ord. *Amyrillidaceæ*, composed of bulbous rooted plants growing in tropical America. About thirty species are known, many having fine, large, white flowers, possessing an agreeable scent. They are highly ornamental, and much prized by horticulturists.

Pandanaceæ. *Screw Pines.*—A nat. ord. of monocotyledonous plants belonging to the intertropical regions of the world, chiefly the Indian archipelago, a few extending as far as Norfolk Island and New Zealand. They have a stem, sometimes rising in the form of trees, with roots sent out regularly from all parts of their trunk, and appearing like artificial props; sometimes they are in the form of bushes, and at others of climbers or creepers. Their leaves are numerous, and inserted spirally along the stem. In some species they are long, straight, and bordered with very hard, sharp, and spiny dentations; in others they are pinnatifid or palmate, embracing at their base, but not sheathing. Some of the species are useful to man as affording edible fruits, others on account of their hard wood, and others again as possessing an astringent juice in their leaves. The genus *Pandanus* is the type of the family, and contains several species found in the islands of the tropical ocean, in Mauritius, and Bourbon, as well as in the southern parts of India. *P. odoratissimus* is

Pandanus odoratissimus.

remarkable for its great fragrance, and is highly prized in all Asiatic countries. In India it is known as the caldera bush, and in the Mauritius as the vauquois plant. *P. candelabra* is remarkable for its mode of branching, and from its resemblance is called the chandelier tree. It is a native of Guinea.

Pandarus.—A genus of parasitic entomostracous *Crustacea.* See CALIGUS.

Pandion. *The Osprey* or *Fish Hawk.*—See AQUILINÆ.

Panicum (*panis*, bread).—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*, and composed of a large number of grasses with flat leaves and flowers in panicles. One of the most important species is *P. miliaceum*, a native of India, and the grass which produces the small grain well known as the millet seed. It grows about three feet high or more, and in the south of Europe, India, and Africa, the seeds are of importance as affording a valuable article of food. The millet has not the nutritive qualities of our cereal plants, but it is cultivated in some parts of France, the seeds being used for poultry, and the grass itself for cattle. Some other species of *Panicum* are valuable as pasture

grasses in different parts of the world. The "Coapim de Angola" of Brazil grows six or seven feet high, and this and other species constitute the field crops on the banks of the Amazon, and are tender and delicate in their herbage. *P. dactylon*, one of the most common species of India, is held sacred by the Brahmins to their god Ganesha, and forms probably three-fourths of the food for horses and cows throughout the greater part of that country. It is known by the name of doob. In Africa, too, we find another species of equal value there. *P. jumentorum*, or Guinea grass, grows four feet high, and though a native of Africa is now cultivated in the West Indies and America, and affords an excellent forage for cattle.

Panopæa (a mythological name).—A genus of molluscous animals belonging to the class *Conchifera*, and containing a small number of species, which range from Ochotsk to the White Sea, and from the Mediterranean to Patagonia, Australia, and New Zealand. The species are generally large. Though only six species have been discovered recent, not fewer than 140 have been discovered in a fossil state, occurring chiefly in the inferior oolite.

Pantholops.—A genus of antelopes. See ANTILOPEÆ.

Panurgidæ.—A family of bees. See APIDÆ.

Papaver. *The Poppy.*—See PAPAVERACEÆ.

Papaveraceæ. *The Poppy family.*—A nat. ord. of dicotyledonous plants, containing a great number of species, most of them herbs, but some approaching to the nature of shrubs. They are distinguished by having a milky or watery coloured juice, and are chiefly natives of Europe, though we find species growing in America, Asia, China, New Holland, and the Cape of Good Hope, &c. The genus *Papaver* is the type of the family. The species have their juice milky, and this possesses well marked narcotic properties. There are many species, almost all fine showy plants, and a good number cultivated in our gardens. The most important of all is the white poppy, *P. somniferum*, from which is obtained that most valuable medicine called "opium." The chief active principle in this substance is morphine, but there are two or three other crystalline principles found in it also, as codeine, meconine, and narcotine. This plant is most probably a native originally of Asia Minor, but is now cultivated in many parts of the world, in India, Turkey, Egypt, and Persia, &c., on account of its inspissated juice, the trade in which is carried on to an immense extent. Turkey opium is the kind chiefly used in Great Britain, and in 1831 and 1832 the quantity entered for home consumption amounted at an average to 28,097 lbs. a-year. In this country opium is chiefly used as a medicine, and as such is of very great value, acting, according to circumstances, as a stimulant, a narcotic, anodyne, or diaphoretic. In China, however, it is extensively used by all classes, where the habit of smoking it is almost universal. The government of China has issued edict after edict, forbidding the importation and consumption of the drug, but with no effect. The quantity consumed is immense, and the importations are chiefly from India. In 1831, 1832, the exports from India to China amounted to above 20,000 chests of 149 lbs. each, worth above 13,000,000 dollars! The white poppy is cultivated to a considerable extent in Spain, Belgium, &c., for the sake of the oil procured from its seeds. This oil is obtained by expression, and is much esteemed in France, both for culinary purposes and for giving light. The quantity produced in France alone amounts annually to about twenty-five or thirty millions of francs.

Papayaceæ.—A nat. ord. of dicotyledonous plants, containing only a few species, most of which are trees possessing a milky juice, long petioled, alternate leaves, cut into palmate or pinnate lobes, and greenish flowers in axillary branches. There are about eight genera known, the principal one being *Papaya* or *Carica*. See CARICA.

Papilio. *The Butterfly genus.* — See PAPILIONIDÆ.

Papilionaceæ (*papilio*, a butterfly).—A division of the nat. ord. of dicotyledonous plants called *Leguminosæ*, containing those species which have their flowers so disposed as to resemble the appearance of a butterfly.

Papilionidæ. *The Butterflies.*—A family of insects belonging to the order *Lepidoptera*, and section *Rhopalocera*. This family comprises the giants of the diurnal tribes, and is distinguished by the perfectly ambulatory structure of the fore legs in both sexes, the antennæ having a distinct club, but never hooked at the tips, and the discoidal cell of the hind wing closed. The species belonging to it are, generally speaking, adorned with bright, vivid, and beautiful colours, and are, in form, the most elegant and highly prized of all the insect class. The perfect insects live on the nectar of flowers, and are furnished with a long proboscis, spirally rolled up under the palpi when at rest. The caterpillars or larvæ are slow, cylindrical, and thickened, and the chrysalids are naked and attached by a silken thread, except in one group, the PARNASSII, which spin a cocoon. The great majority of this numerous family are found in tropical climates, especially in South America and India. The genus *Papilio* may be taken as the type, and is numerous in species, about 300 being known and described. From the beauty of their colours and large size, they were called *Equites* (knights) by Linnæus. Their flight is rapid, their wings being large and strong, and possessing prominent nervures. Many of the species have the hind wings produced into a pair of tails, whence they have obtained the name of "swallow-tails." One of these, *P. machaon*, is a native of Britain, and is the largest, most elegant, and conspicuous butterfly we have. The

white garden, orange, and brimstone butterflies, composing the genus *Pontia*, are also natives of this country, and their larvæ are often very destructive to cabbages, and other vegetable produce of our gardens.

Papio.—A genus of monkeys. See CYNOCEPHALUS.

Papyrus.—A genus of plants. See CYPERACEÆ.

Paradisea.—See PARADISEIDÆ.

Paradiseidæ. *Birds of Paradise.*—A family of birds belonging to the conirostral tribe of the order *Passeres*. The birds of paradise are distinguished by a peculiar union of splendid plumage and elegance of form. They appear confined to the large island of New Guinea and the smaller islands in its vicinity. From the natives of those countries where they are found having always removed the feet and legs from the skins, arose the fable, at one time universally believed, that these birds had no legs. They were said in consequence to pass their whole existence in the air, to live entirely on dew, and to have the eggs hatched in a natural cavity on the back of the male. Hence comes the name of birds of paradise. The natives call them *Manucodiata*, or God's birds. These birds associate in large flocks in the delightful aromatic woods and groves of their native islands. Their chief food consists of insects and fruits, and their flight is very rapid. Several species have been described. The one, perhaps, best known, and the first described, is the great emerald paradise bird, *Paradisea apoda*,

Paradisea apoda.

about the size of the common jay. The plumage is varied and beautiful, and the immense quantity of long, loose, broad floating plumes, of rich hues and of the most delicate texture and appearance, give it a superb look. It perches only upon lofty trees, where it remains concealed by the foliage during the heat of the day, coming forth at sunset and sunrise to seek its food. The chiefs of the countries where they are found use them as ornaments for their turbans, and the ladies of the East, and in Europe also, prize them highly for their head-dresses. The king paradise bird, *Cincinnurus regius*, is perhaps the smallest of all the species, but is equally brilliant and beautiful in plumage. It is peculiarly distinguished by the two naked shafts coming from the upper part of the rump over the middle of the tail, and extending to a considerable length, terminating in a moderately broad gold-green plume, rising only from one side of the shaft, and forming a flat spiral of nearly two convolutions. It is said to be a solitary bird, not condescending to associate with others of the genus. The gold-breasted bird of paradise, *Parotia sex-setacea*, with its brilliant changeable green gorget and its six slender feathers on the sides of its head; and the superb paradise bird, *Lophorina superba*, with its beautiful breast and threat, are both natives of New Guinea, but of their habits little is known.

Paradoxurus (παραδοξος, paradoxical; ουρα, tail).—A genus of animals belonging to the class *Mammalia*, order *Ferœ*, family *Felidæ*, and subfamily *Viverrinæ*. The animals belonging to this genus approach the civets, and were formerly placed in the same genus. Several species are described, but little is known of their habits. They appear to be nocturnal animals, and are carnivorous. Their fur is composed of two kinds of hairs, one woolly, and the other, which are fewer in number, are silky. They chiefly inhabit the island of Java.

Paramecium (παραμηκης, oblong).—A genus of *Infusoria*, composed of very minute animals with a soft flexible body, generally oblong, but varying in form, and covered with numerous vibratile cilia disposed in regular series. They are found in vegetable infusions. *P. aurelia* was known to some of our earlier microscopical observers, having been seen in water in which decaying vegetables had been long kept in such abundance as to discolour it.

Parasita (παρα, by the side of; σιτος, nourishment).—A name given in general to all animals and plants which are found living upon, or obtaining their nourishment from others. Intestinal worms are called *Parasites*. The *Lerneidæ* and *Caligi*, or fish lice, amongst animals; and the *Epiphytes*, and other plants, such as *Lathræa* and *Cuscuta* amongst plants, are called *Parasites*.

Pardalotus.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Ampelidæ*. The birds belonging to this genus are characterized by their beak being very short, tolerably strong and conical, and slightly compressed; the upper mandible slightly arched and notched at the tip; nostrils small, situated at the base of the beak, and pierced in a membrane; wings long and pointed; tail short,

equal, and the tarsi moderate in length, and scutulate. The species are small, squat-looking birds, and most of them natives of Australia, Brazil, and India. *P. punctatus*, an Australian species, has the head and wings black, dotted with white, and is known to the settlers by the name of "diamond bird." It is not very plentiful, but is prized on account of its skin.

Parenchyma (*παρά*, beside or between; *χυμα*, tissue).—A term employed by botanists to designate some particular kinds of cellular tissue.

Paridæ. *The Titmice.*—A sub-family of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Luscinidæ*. The species belonging to this family have short, conical bills, with the tips entire, and the base covered with a few bristles. The nostrils are concealed by the frontal plumes. They are active little birds, found in both hemispheres, continually flitting from branch to branch, and suspending themselves in all kinds of attitudes while seeking for insects on the trees. Seven species of titmice, belonging to the genus *Parus*, are found in Great Britain:—The great tit, *Parus major*; the blue tit, *P. cæruleus*; the crested tit, *P. cristatus*; the coal tit, *P. ater*; the marsh tit, *P. palustris*; the long-tailed tit, *P. (Orites) caudatus*; and the bearded tit, *P. (Panurus) biarmicus*. The great tit frequents houses, and is accused of being very troublesome to the thatch, pulling the straws lengthwise from out the eaves in order to get at the flies concealed between them. It is said, likewise to kill small birds in order to feed upon their brains. The blue tit is a bold little bird, especially when sitting on its eggs or young. It builds its nest in the hollow of a tree, and when it is invaded by a schoolboy, hisses like a snake or an angry kitten, and pecks the hand with great severity. Hence boys call it "Billy Biter." The long-tailed tit is a native, beside Britain, of the whole of Europe, Siberia, Russia, and Japan. It feeds upon insects and larvæ, and builds a very pretty nest of an oval shape, with one small hole in the upper part of the side, by which the bird enters. The bearded titmouse lives in marshy and reedy spots, and feeds chiefly on seeds, insects, and small molluscs. As many as twenty specimens of *Succinea* have been taken from the crop of one bird. This bird is found in the north of Europe, in Asia, on the shores of the Caspian Sea, and is especially abundant in Holland. Amongst species not natives of England, the penduline titmouse, *Paroides pendulinus*, is one of the most remarkable. It is a native principally of the southern and eastern provinces of Europe; also, in Russia, Poland, Hungary, and Austria. It haunts the reedy banks of rivers, or the margins of wide-watered shores, and forms a pendulous purse-like nest, which it generally suspends at the end of some flexible twig.

Parietaria (*paries*, a wall).—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and containing many species of herbs, or under-shrubs, which grow in the temperate and warm parts of the globe, though more especially in the Mediterranean region, North America, and tropical Asia. One of the species, *P. officinalis*, is a native of Great Britain, and is very common throughout the country, growing chiefly on old walls, which being the habit of most of the species, gives it its generic name. The pellitory of the wall, as this species is called, was at one time a very popular remedy in many diseases. As a diuretic, and as a refrigerant in cases of fever, it was much employed. It contains a quantity of nitre in its composition.

Parkia.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Mimoseæ*, and named after the celebrated African traveller Mungo Park. The genus contains only a few species, which grow chiefly in Africa and tropical Asia. They are trees with spineless stems, bipinnate leaves, and distinct red flowers in long peduncled, club-shaped heads. *P. Africana* is the typical species, and is called the nitta, or doura tree of Soudan. It grows to the height of forty or fifty feet, and has strong diffuse branches, with an ash coloured bark. The fruit contains a yellowish pulp of a farinaceous nature, very sweet, and much sought after by the negroes, who make from it a very refreshing drink. The seeds are also used by them as a substiute for coffee.

Parkinsonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Cæsalpineæ*. It is composed of spinous shrubs with pinnated leaves, and yellow flowers possessing an agreeable smell. The principal species, *P. aculeata*, the Barbadoes flower-fence, is a well known West Indian shrub, twelve or fifteen feet high, and having numerous slender branches. In America, and the West Indian Islands, it is much employed to form hedges, which, besides being almost impenetrable from their strong spines, are very agreeable to the sight from their numerous large yellow flowers, spotted with red.

Parmacella (*parma*, a shield).—A genus of gasteropodous *Mollusca* belonging to the inoperculate section of the *Pulmonifera*, and family *Limacidæ*. In the animals of this genus the margin of the mantle is broad, compared to the size of the shell, and forms a shield on the front of the body. The shell is small, concealed, oblong, nearly flat, with a sub-spiral apex. Several species are found in the Canary Islands, south of Europe, and India.

Parmelia.—A genus of lichens. See THALLOGENÆ.

Parmophorus (*parma*, shield; *φορος*, carrier).—A genus of shells. See FISSURELLIDÆ.

Parnassia (from Mount *Parnassus*).—A genus of plants, See DROSERACEÆ.

Parnassius (*Parnassus*).—A genus of insects belonging to the order *Lepidoptera*, section *Rhopa-*

locera, and family *Papilionidæ*. The butterflies belonging to this genus are very beautiful, and the under surface of their wings generally very brilliant. *P. Apollo* is the best known species, is several inches in extent of wings, and is of a white colour, with various black markings. The spots on the wings are of a fine crimson colour, and the general shape is very elegant. The caterpillar is of a velvety-black, and feeds upon the orpins and saxifrages, &c.

Paroides.—A genus of titmice. See PARIDÆ.

Parotia.—A genus of the birds of paradise. See PARADISEIDÆ.

Parra.—A genus of birds belonging to the order *Grallæ*, and family *Palamedeidæ*. The jacanas, as they are called, form a small subfamily, *Parrinæ*, which are characterized by their having the bill short, advanced at the base on the forehead, the toes remarkably long and slender, and furnished with long claws, especially on the hind toe. They are found in the marshes of the warmer parts of Asia, Africa, and South America, where they walk with facility on the floating leaves of aquatic plants. In Brazil, the jacanas, *P. jacana*, are very numerous, and their elegance of movement, and their fearlessness of man, render them very interesting to the traveller. The structure of their feet enables them to walk on the leaves of aquatic plants with as much ease as if they were on land. A species, *P. gallinacea*, is found in Australia. Its habits are the same as the South American species, walking on those floating leaves and herbage which merely rise to the level of the water. It possesses great powers of diving, and can remain under water for a length of time; but its powers of flight are inconsiderable.

Parthenope.—A genus of decapodous *Crustacea* belonging to the section *Brachyura*, and forming the type of the family *Parthenopidæ*. The only species belonging to the genus *P. horrida* has the carapace strongly embossed and tuberculous above, so much so as to give the crab the appearance of a piece of rock eroded by the sea. It is a native of the Indian Ocean.

Parus. *The Titmouse.*—A genus of birds. See PARIDÆ.

Passer. *The Sparrow.*—A genus of birds. See FRINGILLINÆ.

Passeres.—An extensive order of birds characterized by the beak, which is variable in size and shape, being straight and not hooked at the tip; the feet of moderate size, with three toes in front, the two outer ones generally united together at the base, and one behind which is articulated on the same plane with the front ones, enabling them to grasp their perch with ease and security; the claws slender and acute, but never hooked, and the tarsi generally short, and feathered more or less. This order is by no means a natural one, the species which compose it varying very much in form and habits of life. Seeds, herbs, insects, fruits, small birds, and even fishes, are the varied kind of food they live upon. Those which have the beak conical and broad feed on seeds, those which have it slender live upon insects, and those which possess a strong robust bill pursue small birds, &c. They are for the most part solitary birds, though some live in large families. Some of them live almost constantly on the wing, others pass the greater part of their time on trees, whilst others again seem to live almost exclusively upon the ground. Most of our singing birds belong to the order *Passeres*, and some amongst them are excellent imitators of different sounds they are accustomed to hear.

Passiflora (constructed from *Flos Passionis*). *The Passion Flower.*—A genus of dicotyledonous plants belonging to the nat. ord. *Passifloraceæ*, and composed of a considerable number of fine handsome plants, which are either herbaceous, or shrubby, and generally climbers. The greater number are natives of tropical America and the West Indies, a few also occurring in Asia. The flowers of these plants are usually large and showy, and in consequence the species are much cultivated as ornaments for gardens and shrubberies in various parts of the world. The fruit is fleshy, and in some of the species is edible. Those of *P. quadrangularis* and *edulis* are known by the name of grenadillas, the former, a native of Brazil, being as large as a child's head, and the latter furnishing the confectioner with the most delicate material for flavouring ices. The fruit of *P. laurifolia* is known in the West Indies by the name of water lemon, and that of *maliformis* by the name of sweet calabash. Considerable difference of opinion has arisen amongst botanists as to the true nature of the calyx and corolla in the passion flower. Both of these exist, and consist of five divisions, the petals having filamentous or annular processes on their inside, which appear to be an altered whirl or whirls of petals. In the centre there is a column which is the pistil, in this case called a *gynophore*, with five stamens surrounding it. The name of passion flower was given to these plants from a fancied resemblance in the flower to the appearance presented at Calvary. In the five anthers, the superstitious monks saw a resemblance to the wounds of Christ; in the triple style which surmounts the ovary, the three nails on the cross; in the central gynophore, the pillar of the cross; and in the filamentous processes, the rays of light round the Saviour, or the crown of thorns. In some old books there are cuts to be seen in which the flowers are made up of the very things themselves. The best known species, *P. cærulea*, the common passion flower, was originally a native of Brazil and Peru, though now much cultivated in Europe. It is a climbing plant which often attains a length of sixty feet. The flowers, generally of a considerable size, are of a green colour externally, and of a very pale blue internally. The filaments composing the crown of

he flower are purple at their base, pale blue, or white, towards the centre, and of a more lively blue at the extremity. The plant is in bloom during the whole summer, and the flowers are sweet scented.

Passifloraceæ.—A nat. ord. of dicotyledonous plants consisting of species which are herbs, or shrabs, and usually climbing. They are chiefly natives of South America, and the typical genus is PASSIFLORA, containing those plants called passion flowers. Nine other genera, however, are contained in the family, and about 216 species in all. Some of the genera, besides *Passiflora*, yield edible fruits, as for instance, three or four species of *Tacsonia* and *Paropsia*, whilst some others are medicinal. *Murucuja cœllata*, a West Indian climber, is said to be anthelmintic and diaphoretic.

Pastinaca (*pastinum*, a two-pronged fork).—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and containing amongst other species the common parsnip, *P. sativa*. The spindle-shaped root of the variety of this plant, *P. edulis*, is much used, especially on the continent, as a pot-herb; and in the Channel Isles, another variety, *P. coquaine*, with roots three or four feet long, and six inches in circumference, is extensively cultivated as fodder for cattle.

Patella (*patella*, a little dish). *The Limpet.*—A genus of gasteropodous *Mollusca* forming the type of the family *Patellidæ*, and containing a great number of species which are to be found adhering to rocks, &c., in all parts of the world. The animal is distinguished by having a continuous series of branchial lamellæ, and the margin of the mantle fringed all round. The shell is of a conical shape, with a sub-central apex, and covers the whole animal when at rest. The limpets adhere with such force to the rocks upon which they are found, that it is difficult to tear them off without injuring them, and it is said that the atmospheric pressure by which they adhere is fifteen lbs. per square inch. The common limpet, *P. vulgata*, is a most abundant European species, and is much used in Great Britain as an article of food by the poorer classes. Fishermen use it also to a great extent for bait. On the coast of Berwickshire alone, we are informed, that for years no fewer than 12,000,000 were annually collected for this purpose. On the west coast of South America, and on the coasts of California, a very large species occurs, *P. granatis*, individuals of which occur sometimes of such a size as to answer the purpose of a wash-hand basin.

Patellidæ.—A family of gasteropodous *Mollusca*, represented by the genus PATELLA, and containing besides, several others, such as *Acmæa*, *Tectura*, *Gadinia*, *Scutellina*, *Lepeta*, *Nacella*, &c., &c.

Paullinia.—A genus of plants. See SAPINDACEÆ.

Paussidæ.—A family of insects belonging to the order *Coleoptera*, and comprising a good many species, some of which are of a most remarkable form. They are generally small insects, but remarkable for the large size and curious form of their antennæ. They are found about the nests of ants, are nocturnal in their habits, and like the bombardier beetles make a crepitating noise. The genus *Paussus* is the type, containing about twenty species, natives of the Old World, and characterized by their having four unequal palpi, and the antennæ two-jointed, the last joint being large and compressed.

Paussus.—See PAUSSIDÆ.

Panxi.—A genus of birds. See CRACIDÆ.

Pavonariæ.—A group or family of zoophytes. See ANTHOZOA.

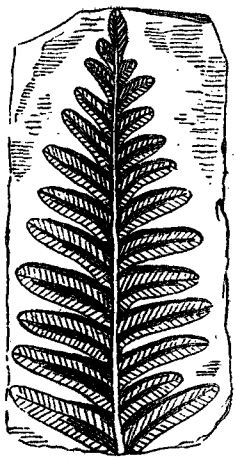
Pavonia.—A genus of corals belonging to the family *Madreporidæ*, the species of which are of a foliated structure.

Pavonia.—A genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*, natives of South America; some remarkable for the beauty of their blossoms, and one possessing a diuretic property.

Pavoninæ. *The Peacock family.*—A subfamily of birds belonging to the order *Gallinæ*, and forming part of the large family *Phasianidæ*. The genus *Pavo*, the peacock, is the type of this little family, which, though it contains but few species, possesses some of the most beautiful and splendid birds we have. A strong, curved, stout beak, a head adorned with an aigrette-like plume of feathers, strong scutulated legs, rounded wings, and tail coverts consisting of very long feathers, which in the male are capable of being elevated like a superb fan, characterize the genus *Pavo*. The common domestic peacock, *Pavo cristatus*, is the species which is the best known, and it has been well observed, that if the title of king of birds depended upon beauty of plumage and not strength, the peacock would certainly be entitled to this apellation. The male bird is certainly very magnificent when in full plumage. Its finely shaped head is adorned with a tuft consisting of twenty-four feathers, whose slender shafts are furnished with webs only at the ends, painted with the most exquisite green, edged with gold; the head, throat, neck, and breast, are of a deep blue, glossed with green and gold; the back of the same tinged with bronze; the scapulars and smaller wing coverts reddish-cream colour, variegated with black; the middle coverts deep blue, glossed with green and gold; and the belly and vest are dusky, with a greenish hue. The tail, which is of a gray-brown, is hidden beneath that which constitutes the distinguishing character of this beautiful bird, its magnificent *train*, which rises above it, and when expanded forms a superb fan of the most resplendent hues: the shafts are white, and are furnished from their origin nearly to the end with divided iridescent barbs; at the extremity of these feathers the barbs unite, and form a flat extended vane, decorated

with what is called the eye. This is a brilliant spot, or circlet, enamelled with the most enchanting colours; yellow, gilded with various shades; green running into blue and bright violet, varying according to its different positions; the whole receiving additional lustre from the colour of the centre, which is a fine velvet-black. When people talk of the peacock spreading its tail, they mistake that organ for these tail coverts. It is of them that the rich display is composed. Though long naturalized in Europe, the peacock is of Eastern origin. It is spread over the north of India and the islands belonging to the Indian Ocean, and in many places occurs wild in the greatest profusion. These wild birds, when compared with our domesticated variety, have been found identically the same. This bird has been known from the earliest periods. In the days of Solomon they were imported into Judea by the fleets which that monarch equipped from the Red Sea, and the *vanity of the peacock* had even become proverbial in the time of Aristotle. In former years, the peacock formed in England one of the dishes in the second course of every great feast, and in the days of chivalry, the adventurous knight made his solemn vow before the peacock and the ladies. The female, or pea-hen, as she is called, wants the gorgeous train of the male, and is altogether of a more sombre hue. The use of this magnificent appendage to the male has not been well explained, though several attempts have been made. It has been asserted that the sudden and unexpected raising of this train is of use as a means of defence, and has the power of terrifying even the tiger when ready to spring upon his prey! Another species, *P. Japonensis*, or *Javanicus*, is also found in the East, and approaches very nearly to the *cristatus*. The Thibet peacock, *Polyprecton Tibetanum*, a native of the mountain chain which separates Hindostan from Thibet, is of a much more sombre hue than the preceding species, but is a fine hardy bird, and is a great favourite with the wealthy Chinese, who procure numbers of it for their aviaries. The argus pheasant, *Argus giganteus*, is another species of peacock, though generally called by the name of *Pheasant*, and is remarkable for the beauty of its plumage. The wings are painted and ocellated in a manner that defies description; the secondaries are of enormous size, and the tail is ornamented with two very long feathers. When at rest or not excited, the ocelli or beauty spots on the secondaries are hardly visible; but when excited by the presence of the female bird, the wings become expanded, and trail upon the ground, so as to show off all their beauties. The flight of the argus pheasant is heavy and of short duration, owing principally to the unwieldy size of the secondaries, but from the same cause it runs, with their aid, very swiftly. Its habits are not very well known, as it is said not to thrive well in confinement. It is a native of Sumatra and Malacca.

Pecopteris.—A genus of fossil plants belonging to the nat. ord. *Filicidæ*, containing no



Pecopteris aquilina.

less than seventy-three different species, all found in the coal formation.

Pecora.—A name given by Linnæus to that order of animals which contains the cloven-footed beasts, as our cattle, or oxen, deer, &c., and synonymous with the *Ruminantia* of Cuvier.

Pecten (*pecten*, a comb).—See PECTENIDÆ.

Pectenidæ.—A family of molluscous animals belonging to the class *Conchifera*, and containing several genera of shells, of which *Pecten*, the scallop, is the type. This genus contains many species, the shells of which are sub-orbicular, regular, resting on the right valve, and generally ribbed. The beaks are approximated, and the dorsal edges of the valves are produced at each side into ears. The hinge has no teeth, the margins are straight and united by a narrow ligament, and the cartilage is internal and received into a central pit. The animals have a moderate sized hatchet-shaped foot, which enables the animal to move about, and they have, especially when young, a tuft of byssus at its base, which passes out at a notch under the front margin of the right valve, by which they affix themselves to rocks and other marine bodies. The mantle is open, the margins double and fringed, and round the edge is a row of small bright eyes, surrounded by tentacular filaments. A number of the species, however, have no byssus, but live free and unattached at the bottom of the sea, at moderate depths, and are able to move about with considerable ease. This motion is produced by the animal suddenly opening and shutting its shell, causing a recoil which carries them sideways. Many of the species are finely coloured, handsome shells, such as *P. pal-*

lium, the duke's mantle, from the Eastern seas, &c. The scallop shell, *P. maximus*, is common on the British coasts, ranging from three to thirty fathoms. The shell is of considerable size, and the deeper valve is used for "scalloping" oysters. Formerly it was employed as a drinking cup, and celebrated as such in Ossian's "hall of shells." The "quin," *P. operculāris*, is still more common than the scallop, covering extensive banks, especially on the north and west of Ireland, in fifteen to twenty-five fathoms water. Both of these species are used as food, and indeed in many places are esteemed as delicacies. The St. James' shell, *P. Jacobæus*, common in the Mediterranean, and nearly allied to the scallop, was worn by pilgrims to the Holy Land, and became the badge of several orders of knighthood.

Pectinaria (*pecten*, a comb).—A genus of *Annelides*; synonymous with *Amphitrite*. See ANNELIDA.

Pectinibranchiata (*pecten*, a comb; *branchiæ*, gills).—An order of gasteropodous *Mollusca*, characterized by the branchiæ or gills being disposed in form of a comb or plume.

Pedestina.—A genus of rodent animals to which the creature well known as the *jumping hare* belongs. See JERBOIDÆ.

Pediastreæ.—A group of minute *Algæ*. See DESMIDIACEÆ.

Pedicellaria.—A name given to certain small pincer-shaped bodies found on the surface of many species of star-fishes, and echini or sea-urchins. Their exact nature is still considered somewhat doubtful, though most naturalists now believe them to be particular organs of the animals themselves upon which they are found, and not parasitic animals, as was first supposed.

Pedicularis (*pediculus*, a louse). *Louse-Wort.*—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, and composed of herbs growing in the temperate and cold regions of the globe, more especially in elevated spots in the northern hemisphere. Between seventy and eighty species are known, one or two of which are common in this country. The marsh louse-wort, *P. palustris*, is found in marshes and wet moors, and is rather a pretty flower, but is believed to be injurious to cattle, producing a certain state of the body which favours the development of *lice* upon them—hence the generic and English names.

Pediculidæ. } *The Louse family* and *genus.*
Pediculus. } —See ANOPLURA.

Pedilanthus (πέδιλον, a slipper; ἄνθος, a flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and composed of lactescent shrubs, spineless, and growing chiefly in America and tropical Asia. *P. tithymaloides*, Jew bush, is a native of the West Indies, where it is often called bastard ipecacuanha, because it possesses powerful emetic and drastic qualities. From all parts of the shrub, but chiefly from its stems and branches, there flows a juice in abundance, which is very acrid, and when placed upon the skin, produces pustules. At Curaçoa the plant is used as an antisyphilitic and emmenagogue.

Pegasus (a proper name). *The Flying Horse.*—A genus of fishes. See SYNGNATHIDÆ.

Pegmatite (πῆγμα, concretion).—A species of granite (binary granite), composed of quartz and felspar. When the felspar contained in it is in a state of decomposition, this rock is employed to make a kind of varnish for porcelain.

Pekea.—A genus of dicotyledonous plants, one of the species of which, *P. tuberculosa*, yields a nut known in the shops by the name of the Saouari, or Sawarra nuts. It is a large tree, inhabiting the woods of Guiana, where it is called by the Indians tatayouba. The nut itself is said to be the best of all the South American nuts that are brought to England, and much superior to our own walnuts, almonds, and filberts.

Pelagius. *The Monk Seal.*—See PHOCIDÆ.

Pelargonium.—A genus of dicotyledonous plants belonging to the nat. ord. *Geraniaceæ*, and containing a large number of showy flowers, which are all known in our greenhouses and gardens by the general name of geranium. At one time all the known species were arranged in the genus *Geranium*; but they differ from that genus by being in general shrubby plants, and having irregular flowers. The species abound at the Cape of Good Hope, to the vegetation of which country they impart a particular character. They are very much cultivated as ornamental plants, and some of them sport into a great many varieties. Two species in particular are greatly cultivated, and from these are derived the greater number of our most esteemed varieties. One of these, *P. grandiflorum*, is a glabrous, glaucous plant, with heart-shaped leaves, divided into five lobes, which are toothed at the extremity. The peduncles are three-flowered, and the flowers are large, white, or rose coloured, the two upper petals being obovate, and streaked with blood-red. The other, *P. nobile*, resembles the latter, but the leaves are more strongly dentated at the extremity, and the flowers are of a pale rose colour, the two upper petals being marked with purple lines. Two or three other species are common in our greenhouses and gardens, where they grow with much less care being required of them than the two first mentioned. Of these, *P. zonale* has a thick, much branched, closely haired stem, often growing two or three feet high when supported, and round heart-shaped leaves, marked on the upper surface with brown zones. The plant exhales a strong, disagreeable odour. *P. odoratissimum*, on the other hand, is remarkable for the particular fragrance of its leaves, especially when rubbed between the fingers.

Pelecanidæ.—A family of birds belonging to the order *Anseres*, and embracing in it a number of species, characterized by having a long,

strong, hooked bill, the nostrils basal, all the four toes connected by a membrane, the throat sometimes furnished with a dilatable pouch, and long, pointed wings. This family is divided into three sub-families, *Plotinæ*, represented by the genus PLOTUS or darter; *Phaetoninæ*, represented by the genus PHÆTON; and *Pelecaninæ*, the pelicans, represented by the genus *Pelecanus*. This latter genus contains several species, of which the common pelican may be taken as the type. They are characterized by having a long, straight, broad bill, with the upper mandible flattened, terminated by a strong hook or nail, which is compressed and much bent, and a lower mandible, formed by two bony branches, depressed, flexible, and united at the point. A large membrane occupies the space between these two branches, and forms a sac, which is capable of being greatly distended. The wings are long, and the tail is ample in width, but short. Their feet are palmate, and provided with three anterior toes, and a hind one articulated anteriorly, but on the same plane. Pelicans are remarkable for the swiftness and long continued nature of their flight, considering their size. This is owing to the bones of these birds being extremely hollow and destitute of marrow, and traversed throughout the whole extent with large cells. They live in society, are migratory birds, and at the period of their migrations they may be seen in flocks of 200 or 300 individuals, flying close together in a straight line. They are good swimmers and divers, and it is by this latter method they capture their prey. Poising themselves at an elevation of fifteen or twenty feet above the surface of the sea, the moment they discern a fish beneath them, they dart down with the greatest impetuosity, and seizing it, deposit it in the sac under the mandible. Having filled the sac, they retire to some quiet spot to devour their prey at leisure. The pelicans in the Crimea and southern Russia use another method of capturing fish. A number collect together on the banks of one of the limans, and extending round it in the form of a crescent, flapping their wings and plunging into the water, they drive the fish into a small space, where they easily take them. Having filled their capacious pouch, they then retire to the shore to eat their prey at leisure. The large membranous sac of the pelicans is used by the natives of America for various purposes. It is employed to make hats and bonnets, and, left adhering to the mandible, it is used as a scoop to bale the water out of their canoes. The Siamese make strings for their musical instruments, and European sailors frequently make tobacco pouches of it. Pelicans breed on the rocks, near the edge of the sea, and deposit their eggs on the ground, or in some slight hollow, without taking the trouble to construct a nest. Nevertheless, the pelican is described by the ancient poets and painters as the model of maternal affection. It is always represented as wounding its breast, and feeding its young with its blood. This classical fable has, no doubt, taken its origin from the fact of the pelican pressing its under mandible against its breast, to assist the bird in disgorging the contents of its capacious pouch. The common pelican, *Pelecanus onocrotalus*, is found in the Oriental countries of

Pelecanus onocrotalus.

Europe, and is very common in the lakes and rivers of Hungary and Russia. It is met with also in Egypt, at the Cape of Good Hope, in tropical Africa and India, and even in Japan. The colour of this bird is white, faintly tinged with flesh or light rose colour, and the pouch is yellow. It is about five or six feet long, and the expanse of wings measures twelve or thirteen feet. The species mentioned above as occurring in southern Russia is the *P. crispus*. The brown pelican, *P. fuscus*, is common in the seas of the West Indies, South America, and India.

Pelecanus. *The Pelican.*—See PELECANIDÆ.

Peltocephala (πέλτον, a buckler; κεφαλή, head).—A division of parasitic entomostracous *Crustacea*, belonging to the order *Siphonostoma*, and distinguished by the head of the animals being shield-shaped and much larger than the abdomen. To this division belong the CALIGIDÆ, PANDARUS, &c.

Pemphredon.—A genus of insects. See CRABRONIDÆ.

Penelope.—A genus of birds. See CRACIDÆ.

Penicillium.—A genus of acotyledonous plants belonging to the nat. ord. *Fungi*, and family *Mucedines*. One of the most common and most puzzling plants of the class to which the family belongs is a species of this genus, *P. glaucum*. It is the commonest of the constituents of the greenish or bluish mould formed on decaying vegetable substances of all kinds, especially on semi-fluid or liquid matters, where it forms a dense pasty crust, slimy on the lower surface, coloured and pulverulent above. This *mould* invariably makes its appearance under certain circumstances, associated with the vinegar plant and the yeast plant, towards the close of the ordinary development of these fungi. It would appear, therefore, that these plants are only the mycelia or spawn of the genus *Penicillium*.

Pennatulidæ (*penna*, a feather).—A family of zoophytes. See ANTHOZOA.

Pentaceros (πεντε, five; κερας, horn).—A genus of echinodermatous animals. See ASTERIADÆ. Also a genus of acanthopterygious fishes belonging to the family *Percidæ*, and containing only one species, which is a native of the seas at the Cape of Good Hope. This fish, *P. capensis*, has the fins of the perch family, *Percidæ*, but bears the general appearance, in other respects, of being a species of *Ostracion*. It is nearly as high as it is long, and is of a triangular shape. The body is covered with hard, close set scales, and is furnished with five horn-like plates, projecting from the middle of the bone of the nose under the eye. It is about three inches long, and is of a silvery or greenish-yellow colour, regularly marbled with deep brown.

Pentacrinus (πεντε, five; five-angled; κρινος, lily).—A genus of echinodermatous animals. See CRINOIDEA.

Pentactæ.—A sub-family of echinodermatous animals belonging to the family *Holothuriidæ*, and containing a number of species formerly described under the genus *Holothuria*, and known by the name of sea cucumbers. Eleven or twelve species are British.

Pentadesma.—A genus of plants. See CLUSIACEÆ.

Pentamera (πεντε, five; μερος, part).—A division of coleopterous insects, containing those beetles which have five joints to the tarsi of all their legs.

Pentastoma (πεντε, five; στομα, mouth).—A genus of *Entozoa* or intestinal worms, belonging to the order *Acanthotheca*. The species described are not numerous, and are found in various cavities of different animals.

Peperomia.—A genus of the pepper family. See PIPERACEÆ.

Perameles (πηρα, a bag; *meles*, badger).—A genus of marsupial animals. See MACROPIDÆ.

Perca. *The Perch.*—See PERCIDÆ.

Percidæ. *The Perch family.*—A family of acanthopterygious fishes, chiefly characterized by having seven branchiostegals, and the ventral fins composed of five jointed rays. The perches are of an oblong form, the body being more or less compressed, and covered with ctenoid scales, the outer surface of which is rough, and the edges denticulate and ciliated. The mouth is of considerable size, and furnished with teeth, not only on the jaws, but on the vomer, and on each palatine bone. The species are very numerous, inhabiting both the fresh water and the sea; and a good number of genera have been instituted to receive them. The number of fins are not less than seven, sometimes eight; and they may be divided into two large groups—one with two dorsals, or one deeply notched, and the other with a single dorsal. In general they are desirable fishes for the table. The genus *Perca* is the type; and the true perches may be distinguished by their operculum being spiny, the preoperculum toothed, and the ventral fins placed exactly under the pectorals. The teeth are velvet like. The greater number live in fresh water. The common perch, *Perca fluviatilis*, may be taken as the typical species. It is one of our most beautiful and best eating fresh water fishes, and is very abundant in England, in various parts of Europe, and the temperate parts of northern Asia. Ordinarily the common perch is not of great size, being from ten to eighteen inches long; but in the large lakes of Sweden and Lapland they grow, it is said, to 3¼ feet in length. It is a curious part of their history that, when they live in small lakes, they never attain a large size; but when they are found inhabiting large lakes, they become greatly increased in bulk. The perch is a voracious carnivorous fish, feeding on insects, smaller fish, worms, tadpoles, and small reptiles. It lives generally solitary, seldom in large troops. The ovary of the female is very large; she deposits her ova, united together by a viscid matter, in lengthened strings; and it has been calculated that one fish has from 281,000 to 1,000,000 eggs. The perch was well known to the ancients. Its flesh is good, firm, white, and easy of digestion. Several other species of *Perca* are found in America, the West Indies, &c. The basse or sea perch, *Labrax lupus*, is a marine species, occurring along the Dutch and British shores, and is abundant in the Mediterranean. It has a chaste and pleasing aspect, but does not possess the lively colours of the fresh water species.* Its upper parts are gray, with bluish reflections, which gradually shade away into a silvery-whiteness on the under surface. The pectoral fins are slightly tinged with red. It is a voracious fish, with a remarkably large stomach, and was called by the Romans, on this account, *Lupus*, which, as a specific name, it still retains. The basse was highly esteemed by the ancients as an article of food; and the Greeks considered it one of the most cunning of fishes, having a very tender regard for its own safety. Aristotle asserts that when it is surrounded by a net, it digs for itself a channel of escape through the sand. Its general size is from 1½ to two feet, but it sometimes reaches a length of three feet. Amongst the species with one dorsal only, the genus *Serranus* is one of the most important. They also are sometimes called *sea perches*. The species are very numerous, and many of them very beautiful. Some of those found in the Mediterranean were well known to the Romans. One species, removed now, however, to the genus *Anthias*, has been particularly noticed by ancient writers. Aristotle says that the fishers of sponges in his time called it *sacred*, because no voracious fishes came to the places which it frequented, and the divers might descend with safety.

Percis.—A genus of acanthopterygious fishes belonging to the family *Percidæ*, and containing

a number of species, distinguished by the ventral fins being placed in advance of the pectorals. They are all natives of the Indian Ocean; but of their habits we know little or nothing.

Perdix. *The Partridge.*—A genus of birds belonging to the order *Gallinæ*, family *Tetraonidæ*, and forming the type of a sub-family, *Perdicinæ*. The genus may be easily known by its round body, short limbs, small head, short strong bill, naked at the base, short tail, and the terrestrial habits of the species. They are very numerous, and live generally in large families. Some of them live in unfrequented places, on little hills in the gorges of valleys covered with brushwood; others choose elevated, dry, and rocky places, upon lofty mountains, where they live during the summer, never descending to the plains till winter comes on. In this country partridges always roost on the ground in large fields, at a distance from hedges and coverts, and they seldom stray from the place where they were born. They are very quick runners, and seldom fly, unless they wish to go long distances. When, however, they take wing, their flight is rapid, direct, generally low, and at first starting is accompanied with a loud *whirring* noise, produced by the strong flapping of their wings. They are timid birds, of a gentle disposition, and easily frightened by the least noise, or by the sight of anything unusual. They are very circumspect, however, and wary. Birds of prey especially alarm these timid birds; and it is not unusual to see a partridge so terrified by the presence of a hawk, or other rapacious bird, as to allow itself to be taken by the hand without making any attempt at flight. The females make their nest on the ground, in a slight excavation, which they hollow out with their feet, and which they line with dried leaves and grass. The maternal affection for their young, which are generally called "pouts," has been the theme of many writers on natural history. Their food consists of seeds, chiefly those of cereal plants, as wheat, barley, &c., but they feed also on insects and herbs. Their flesh is excellent, and they are much sought after for the table throughout all Europe. There are a considerable number of partridges known. The common or gray partridge, *Perdix cinerea*, is, however, the most common and widest spread of all the species. It is one of our best game birds, and furnishes in the season one of the most delicate kinds of food for our tables. It abounds in all parts of Europe, and has been said to occur occasionally in Egypt and Barbary. A peculiar variety of this bird, though by some ornithologists considered a distinct species, is the passenger partridge, *P. Damascena*. This bird is smaller than the common partridge, and differs in its mode of life. It is decidedly a bird of passage, though its migrations are by no means regular. They are met with occasionally in large flocks in Egypt and Turkey, and in many parts of France. They do not mix with the common partridge; they are much wilder, fly much higher, and their flight is much longer sustained. The red-legged partridge, *P. rubra*, is not so widely diffused throughout Europe as the gray partridge. It is almost entirely confined to the southern countries, is common in Spain and Italy, and is also a native of Asia and Africa. It is also found in the islands of Guernsey and Jersey, and is often called the Guernsey partridge. The francolins, *Francolinus*, were at one time considered as belonging to the genus *Perdix*, but they are distinguished by the beak being longer and stronger, the tail being longer, the tarsi being furnished with well developed, but blunt spurs, and by their habits of life. They reside in damp forests, and perch on trees. The common francolin, *Francolinus vulgaris*, is an elegant bird, about a foot in length, and is a native of the warmer parts of Europe. It has a loud whistle, and its flesh is much esteemed. The Pondicherry francolin, *F. Pondicerianus*, is a beautiful species, found in great abundance in the Deccan, frequenting gardens and cultivated lands. The partridge is represented in America by the colins, *Ortyx*. Several species are described, one of which has long been known as the American partridge, *Ortyx Virginianus*. It is a very common bird, and is found from New England to Honduras. It feeds upon grain of all kinds, and appears to be especially fond of buckwheat and Indian corn. Its flesh is said to be very white, tender, and delicate. The Californian quail, *Ortyx* (*Lophortyx*) *Californicus*, is a handsome species, remarkable for the fine crest of feathers on its head, and is found in California. The quails, *Coturnix*, are still more nearly allied to the partridge. They have the same rounded figure and short tail, and the tarsi are spurless. The species are found in the Old World and Australia. The common quail, *C. dactylisonans* (*Tetrao Coturnix*), is a well known bird and widely distributed. It is abundant in North Africa, most parts of India, and in almost all parts of Europe, including the southern parts of Siberia. They are birds of passage, and though they permanently reside in some parts of Spain and Italy, &c., yet immense numbers migrate thither in spring from the parched plains of Africa. Quails were well known to the ancients, and their pugnacious disposition was taken advantage of by them to form an amusement for their idle time. It has been asserted that quails were not the birds referred to in the Bible, as forming the food of the Israelites in the desert; but the evidence in favour of this very species being the bird designated *quail* in our translations seems to preponderate. The Chinese quail, *Coturnix excalfactoria*, is used by the Chinese at the present day for *sport*, in the same manner as the common quail was by the Romans. It is an elegant little species, abundant in Manilla and the Philippine Islands, and amazingly numerous

in China. They are kept in cages for the singular purpose of warming the hands of their owners in winter, as well as for the purpose of fighting.

Perennibranchiata (*perennis*, durable; *branchiæ*, gills).—An order of amphibious animals belonging to the class *Batrachia*, and containing those genera in which the branchiæ or gills are persistent throughout life; possessing in the adult state both lungs and external gills. To this order belong the *Sirenidæ*, including the genera proteus, siren, axolotl, &c. See SIRENIDÆ.

Pergularia.—A genus of dicotyledonous plants belonging to the nat. ord. *Asclepiadaceæ*, and containing several species of twining herbs which are remarkable for the sweet scent of their yellow flowers. They are much cultivated in India and China for their fragrant odour.

Periclase.—Native magnesia. See MAGNESIA.

Peridineum (*περιδινεω*, to turn).—A genus of infusorial animalcules, characterized by having a hard, membranous shell, through the orifices of which issue in one place a long flagelliform filament, the organ of motion, and in another place one or more rows of vibratile cilia occupying a pretty large furrow. Some of the species are fresh water, others are marine. Several from the Baltic are highly phosphorescent.

Peristeria.—A genus of plants. See ORCHIDACEÆ.

Perlidæ.—A family of insects belonging to the order *Neuroptera*, distinguished by their wings being unequal, the posterior being much the larger and folded, and being longer than the abdomen; the antennæ being setaceous, multiarticulate, and nearly as long as the body; the mandibles being ordinarily rudimental and the other parts of the mouth membrano-coriaceous. The species live in marshy places, the edges of ponds and rivers, &c., attaching themselves to stones, wood, and plants, growing close to the water. They make little use of their wings during the day, being sluggish in their movements and flying chiefly in the evening, and some of the larger species are well known to anglers as bait for trout. The females carry a bag of eggs suspended to the extremity of their abdomen. The larvæ live in the water, and appear to prefer running streams. They are carnivorous, have the mandibles and maxillæ robust and toothed, pass the winter at the bottom of the water, shed their skins several times, and resemble the imago with the exception of their wanting wings. They assume the pupa form in spring. The pupa is active, and resembles the imago still more than the larva does, having the possession of rudimental wing cases. A short time before they assume the perfect state, the pupæ leave the water and fix themselves upon stones or plants on the brink. In that situation the skin dries and splits, and then the perfect insect comes forth. The genus *Perla* is the type, and contains many species. Some of these are found in high northern latitudes, actually appearing over the snow at the first approach of spring before the ground is cleared.

Perna (*perna*, a gammon of bacon).—A genus of molluscous animals belonging to the class *Conchifera*, family *Aviculidæ*, and distinguished by the shells having a very thick hinge margin, with a row of pits in the form of furrows, to receive the cartilage. They possess a thick and rough byssus by which the animal fixes itself to rocks and stones. The genus contains about sixteen recent species, natives of the tropical seas, and about thirty fossil.

Pernis. *The Honey Buzzard.*—See MILVINÆ.

Persea. *The Alligator Pear.*—See LAURACEÆ.

Petalocera (*πεταλον*, a leaf; *κερας*, a horn).—A tribe of coleopterous insects containing those beetles which have their antennæ terminated by a foliated mass. Such are the cockchafer, MELOLONTHA; the stag beetles, LUCANIDÆ; the rose-beetles, CETONIDÆ, the SCARABEI, &c.

Petalura (*πεταλον*, a leaf; *ουρα*, tail).—A genus of insects belonging to the order *Neuroptera*, and family *Libellulidæ*. The genus contains a number of gigantic dragon-flies, found in Australia and New Zealand, and a species apparently belonging to the same genus is found fossil in England.

Petasites (*πετασος*, a hat).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Corymbiferæ*, and composed of a number of species of herbs with a scape covered with membranous glabrous scales, often woolly, and terminating in a thyrse of flowers. The leaves, which are sometimes very large, do not show themselves till the flowers have disappeared. The species grow chiefly in moist situations, and are found generally distributed throughout Europe. *P. vulgaris* (*Tussilago Petasites*), the butter-burr, the most common species perhaps, is found abundantly in this country. The scape is terminated by a thyrse of flowers of a purple colour, and the leaves are heart-shaped and of great size. The plant grows by river sides in extensive patches, in deans and wet corners of meadows, where the soil is deep and sandy. The leaves are the largest of any British plant, and the jungles they form give a peculiar aspect to the places where they grow. They shelter the nests of many of our small birds, and the flowers are much visited by the early bees. In country districts, a decoction of the roots has been extensively used for scorbutic complaints.

Petaurus. *The Flying Phalanger.*—A genus of marsupial animals belonging to the kangaroos, and deriving its name from the Greek word *πεταυρον*, an instrument to throw stones; in allusion to the way in which the animals dart from branch to branch, as if shot with an engine. See MACROPIDÆ.

Petiveria (after *Petiver*).—A genus of dicotyledonous plants belonging to the nat. ord. *Phytolaccaceæ*, and forming the type of a small sub-order *Petiverieæ*. The genus is composed of somewhat shrubby herbs, with stipulate, entire leaves; natives of the West Indies, and possessing the odour of garlic. *P. alliacea*, the Guinea hen weed, grows abundantly in the meadows of Jamaica and other West India Islands, and is often eaten by cows, to whose milk it imparts a disagreeable odour of garlic. The *Pintado* or Guinea hen seems fond of this plant, hence its English name. The roots are used by the natives to cure toothache, and to preserve woollen clothes from the attack of insects.

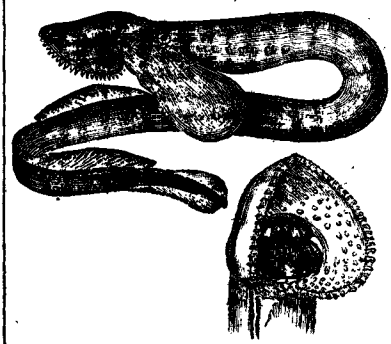
Petricola (πετρος, a rock; *colo*, to inhabit).—A genus of molluscous animals belonging to the class *Conchifera*, and forming the type of a small family allied to the veneridæ. The family *Petricolidæ* contains about thirty species of shells which are peculiar from their living in the interior of stones, limestone rocks, and mud, into which the animals bore. The shell is thin and tumid, inequilateral, the anterior side short, and the posterior end a little gaping. The species occur in Europe, United States, and western coasts of America from Sitka to Peru, India, New Zealand, and the Pacific. About a dozen are found fossil in the eocene formations.

Petrogale (πετρος, rock; γαλη, cat).—A genus of marsupial animals belonging to the family *Macropidæ*. The rock kangaroos, as some of the species are called, are gregarious and nocturnal in their habits. They live on the mountainous regions of north-western Australia, and are very agile, leaping from rock to rock like the chamois goat. Their flesh is considered excellent.

Petroica.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, family *Luscinidæ*, and sub-family *Luscininæ*. The species are all natives of Australia, where they go by the name of robin, and like the robins of England show great familiarity with man. Their song, however, is not equal in power to our little favourites; being much more feeble.

Petroleum.—A synonym of NAPHTHA.

Petromyzon (πετρος, a stone; μυζω, to suck). *The Lampreys.*—A genus of fishes, by some authors placed in the order *Chondropterygii*, but by others removed from that order, and placed in the order *Dermopteri*, sub-order *Marsipobranchii* or *Cyclostomi* (suckers), and forming the type of a small family, *Petromyzodontidæ*. They are characterized by possessing a skeleton the most imperfect of all vertebrated animals, and are distinguished by having seven branchial openings on each side, being destitute of pectoral and ventral fins, and by the skin under the tail forming a kind of fin. Their mouth is circular and armed with strong teeth, while the inner disc is garnished with rasp-like tubercles. The tongue is furnished with two longitudinal rows of small teeth, and by its peculiar movement in the mouth acts as a piston, enabling the fish to attach itself by suction to foreign bodies, such as rocks, stones, pieces of wood, &c. They also use this method



Geotria Australis—Australian Lamprey.

of attacking large fish, adhering to them, and eating their flesh by means of their rasp-like teeth. Their chief nourishment, however, depends upon worms and young fishes. The lampreys are eel-like fishes, of a cylindrical form, compressed towards the tail, and destitute of scales. They are found in almost all parts of the world, in the Mediterranean, on the shores of South America, in the open ocean, &c. The large lamprey, *P. marinus*, often reaches the length of two feet or more, and is marked with brown upon a yellow ground. It is not uncommon in England, occurring, in spring and summer, in considerable numbers in some of the rivers on the southern coast, as the Severn, &c., and its flesh is much esteemed. The river lamprey or lampern, *P. fluviatilis*, is about a foot in length, and coloured like the common eel. It is common in fresh water lakes and rivers, especially in the north of Europe, and occurs abundantly in many of the English rivers. In this country it was at one time a fish of considerable importance, being sold to the Dutch in large quantities as bait for cod. Immense numbers were at one time taken in the River Thames, as many as 400,000 having been sold in one season, at the rate of forty shillings per thousand. The species here figured is an Australian lamprey, belonging to the genus *Geotria*. Recent observations have proved the curious fact that the genus *Ammocœtes* is only the immature state, a sort of larva, of a *Petromyzon*.

Petroselinum (πετρος, rock; σελινον, parsley). *The Parsley.*—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and containing several species, of which the common parsley, *P. sativum* (*Apium Petroselinum*), is the type. This plant grows wild on rocks

and old walls, and is extensively cultivated. It is one of our best known culinary herbs, and was used by the ancients as a crown for the victor in the Nemæan games.

Petrosilex.—A mineral. See FELSPAR.

Petunia.—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and containing several well known handsome flowers, which are much cultivated by horticulturists and amateurs. They are natives of South America, and one of the best known species is *P. nyctaginiflora*.

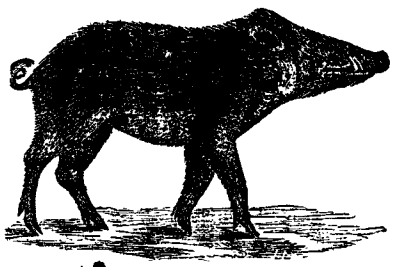
Petuntze.—A variety of felspar rock, containing much quartz. It is the Chinese name for a white earth used by them along with kaolin, in the manufacture of porcelain. From its fusibility it is used for glazing the ware.

Peucedanum (πευκέδανος, bitter).—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and consisting of upwards of forty species of glabrous herbs, which are found in various parts of the world, but especially the southern parts of Europe, Central Asia, and the East Indies. The typical species, *P. officinale* (*Selinum peucedanum*), is a plant which grows in marshy and shady places throughout Europe and in Great Britain. The juice of the roots is resinous, and has a peculiar sulphureous smell. Pigs are said to be very fond of them, hence the plant is generally known by the name of hog's fennel.

Peziza.—A genus of acotyledonous plants belonging to the *Discomycetous Fungi*. This genus is one of the most extensive of the order to which it belongs. Upwards of 300 species are known, of which 106 are natives of Great Britain. Some of them are very remarkable from the regular cup-like form, and the deep colours they present. *P. coccinea* is one of the most beautiful of fungi; the outer surface of the cup which it forms being white and downy, whilst the inside is of the richest carmine. This little plant has an additional interest in the eyes of the botanist, for its beauty led Persoon to the study of the class, of the scientific arrangement of which he was the first to lay the foundation.

Pezoporinæ.—A sub-family of birds belonging to the order *Scansores*, and family *Psittacidæ*, of which the genus *Pezoporus* is the type. See PSITTACIDÆ.

Phacochærus (φακὸς, wart; χοῖρος, pig). *The Warty Hog.*—A genus of pachydermatous animals belonging to the order *Ungulata*, family *Elephantidæ*, and sub-family *Suinæ*. The animals of this genus have the general form of the pigs, but are even more heavy looking, and they differ somewhat also in their dental system. They are remarkable for possessing on each side of the cheek a large tubercle or wart which gives them their name. Their eyes are very small, and they appear only able to see straight forward. Their ears are large and the sense of smell is acute. In the wild state the warty hogs are fierce and intractable. They live



Phacochærus Æthiopicus—Wart Hog.

upon bulbs and roots. Four species are known, all natives of Africa.

Phaeton. *The Tropic Bird.*—A genus of birds belonging to the order *Anseres*, family *Pelecanidæ*, and forming the type of a small sub-family, *Phaetoninæ*. A long, pointed, strong bill inclined towards the extremity, and denticulate on its edges, short feet, the toes all united by a membrane, long wings, and a tail composed of fourteen feathers, the two middle ones of which are very long and slender, are the characters which distinguish this genus. The latter character has given rise to its two familiar names; the French calling it "Paille-en-queue," and the English sailors naming it the "Boatswain bird," from a fancied resemblance these long feathers have to a *marlin-spike*. The phaetons are oceanic birds, and are generally met with far out at sea, flying very high, and with great rapidity. They feed upon fish, darting down from a lofty height with great impetuosity. Their principal prey is the flying-fish, and as these fishes are chiefly to be met with within the tropics, and as navigators hail the appearance of these birds as the harbingers of their approach to the tropics, the birds have obtained the name of tropic birds. They frequent for the purpose of breeding, &c., the most unfrequented islands in the middle of the ocean, and place their nest, some in holes of trees, others in concavities of rocks in the most inaccessible spots. Three species are satisfactorily ascertained, but more have been indicated.

Phalacrocorax = Graculus. *The Cormorant.*—A genus of birds belonging to the order *Anseres*, and family *Pelecanidæ*. There are various species of cormorants, but one of them, *P. Carbo*, is well known in this country as one of the most voracious of birds. His skill in diving is most admirable, and he is most successful in obtaining his prey. A species commonly called the fishing cormorant, is abundant in China, and is trained by the natives to catch fish.

Phalæna. *The Moths.*—The genus *Phalæna* was established by Linnæus to embrace the noc-

turnal *Lepidoptera*, known by the general name of moths. Our knowledge of these insects has, however, increased so much of late years, and so many new species have been discovered in various parts of the world, that it has been necessary to create many new genera. Indeed now *Phalæna* has disappeared altogether as a genus, and has been converted into a large tribe, which in modern systems is known by the name of HETEROCERA.

Phalangidæ (φαλαγξ, a joint).—A family of insects belonging to the class *Arachnidæ*, of which the genus *Phalangium* is the type. The species belonging to this genus are known by the name of harvest-men or shepherd-spiders, and are remarkable for the great length of their legs. This structure enables them not only to walk upon the shrubs and plants amongst which they live, but it serves the additional purpose of escaping from their enemies. When the spider is settled upon a wall or the trunk of a tree, it spreads its legs out in a circular form so as to occupy a large space. Should any animal come near it, it must come in contact with some of these legs, and the moment the spider feels the touch, it withdraws them suddenly, darts with rapidity to the ground, and runs with the greatest swiftness.

Phalangista (φαλαγξ, a joint).—A genus of kangaroos. See MACROPIDÆ.

Phalaris.—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*, and containing several species of grasses, one of the most interesting of which is the canary grass. This plant, *P. canariensis*, is a native of the Canary Islands, but is now naturalized in Europe. It is cultivated in the Isle of Thanet and some other parts of Kent. Its chief use is to furnish seed for birds.

Phalaropus (φαλαρος, brilliant; πους, foot). *The Phalarope.*—A genus of birds belonging to the order *Grallæ*, and family *Scolopacidæ*. A slender, straight, pointed bill; slender, partially webbed feet, with compressed tarsi; the three anterior toes united up to the first joint, the other joints furnished with festooned or lobated membranes, denticulated on their edges; hind toe free, short, with a slender nail, and moderately long wings, distinguish this genus from its neighbours. The species are good swimmers, and are seen enjoying themselves equally on the stormy sea and on the calm inland lake, where they feed upon insects, worms, or crustacea living on the surface of the water. They are rarely seen on land except at the breeding season. The female constructs her nest near the water's edge. They breed chiefly within the arctic circle, and live in small flocks. Three species are described, though it is probable they are only different states of plumage of one and the same. The winter plumage bird is the *P. lobatus*, the summer plumage forms the *P. hyperborea*, and the young bird before it moults is the gray phalarope. They are common in the northern seas from the north of Scotland as far as to Lapland, and generally indeed within the arctic circle. They are also met with on the Lake of Geneva, in the Caspian Sea, and in America.

Phallus.—A genus of acotyledonous plants belonging to the gasteromycetous *Fungi*. The species, which are sometimes called stink-horns, are solitary fungi, growing on wood, and not uncommonly on ordinary soil. All the species emit, when growing, a most disgusting odour. The stinking phallus, *P. fœtidus*, is a common plant in Great Britain, and is remarkable for its quick growth. Mr. Ward found a specimen in one of his glazed cases grow three inches in length in the course of twenty-five minutes, and attain its full elevation of four inches in one hour and a-half.

Phanerogamia or **Phænogamia** (φανερος, conspicuous; γαμος, marriage). A botanical term for those plants which have visible flowers and seeds, and used in contradistinction to *Cryptogamous* plants, or those in which the flowers or their essential parts are not visible.

Phanéropneumona (φανερος, conspicuous; πνευμων, lungs).—A division of the pulmoniferous *Gasteropoda*, including those land shells which breathe air by means of a lung, and possess an operculum, as *Cyclostoma*, *Helicina*, &c.

Pharyngognathi. — An order of fishes characterized by all the species having the lower pharyngeals united to form one bone. They have a bony skeleton, and their skin is covered with scales. Some of the genera belonging to this order have fins without spines, and others with spines. To the first set belong the family *Scomberesocidæ*, which are represented by the genera *Belone*, or green bones, *Exocœtus*, or flying-fishes, a genus named *Hemiramphus*, which contains thirty species, and *Scomberesox*, the best known species of which is the saury pike or skipper of the British seas. All these fishes have the faculty of leaping frequently from the water, and there seems to be something in their constitution which impels them to this movement, one which is carried out to the fullest extent by the flying-fishes, the *Exocœti*; these fishes being organized, by the large size of their pectoral fins and the muscles which move them, to fly to a greater distance through the air than any others of the finny tribes. To the second group, or those which have spines on their fins, belong the *Chromididæ*, which are characterized by the species having only one nostril to each nasal sac; and the *Cteno-Labridæ*, a small, but very natural family, separated from the *Sciænidæ* by their united pharyngeals, and the want of muciferous cellular structure in the bones of the skull. These are small, compressed, oval, or oblong fishes, clothed with large ctenoid scales, and having a short moderately high tail. They are edible fishes, but as they are small, and do not

assemble together in any great numbers, they do not form the objects of any special fisheries. Some of them, as the species of the genus *Glyphisodon*, are prettily banded and show a pleasing combination of colours. There are eight genera belonging to this family, and a considerable number, about eighty species, have been described. To this group belong also the *Cyclolabridæ*, a large family containing 24 genera and about 400 species. They are oval, elliptical, or oblong fishes, more or less compressed, clothed with cycloid scales; their jaws are covered with fleshy lips, and the palate is smooth and toothless. This family is represented by the genera LABRUS, SCARUS, &c., which see.

Phascogale (*φασκολος*, a pouch; *γαλη*, cat).—A genus of marsupial animals. See DASYURUS.

Phascolarctos (*φασκολος*, pouch; *αρκτος*, bear). *The Koala.*—A genus of marsupial animals. See MACROPIDÆ.

Phascolomys (*φασκολος*, pouch; *μυς*, rat). *The Wombat.*—A genus of marsupial animals. See MACROPIDÆ.

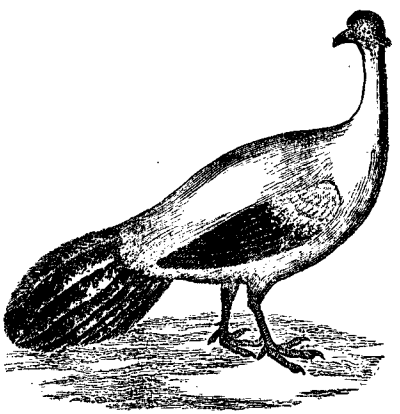
Phascolotherium (*φασκολος*, pouch; *θηριον*, wild beast).—A fossil genus of marsupial animals. See MACROPIDÆ.

Phaseolus.—A genus of dicotyledonous plants belonging to the nat. ord. LEGUMINOSÆ, and containing several species of leguminous plants of considerable importance. The kidney bean, *P. vulgaris*, and the scarlet runner, *P. multiflorus*, are well known species. The ripe seeds of these plants are the haricots of the French. Several species are natives of India, and are as much cultivated in that country as the two preceding ones are in Europe. The moog, *P. Mungo*; the black gram or kala moog, *P. Max*; and the mash or oorud, *P. radiatus*, are, along with some others, very much cultivated throughout India, and their ripe seeds are used by the natives as a portion of their ordinary diet.

Phasgonura.—A genus of grasshoppers. See GRYLLIDÆ.

Phasianella.—A genus of gasteropodous *Mollusca* belonging to the family *Turbinidæ*, and containing about twenty-five species of polished, richly coloured shells, natives of Australia, India, the Mediterranean, and West Indies. About seventy species are found fossil.

Phasianidæ (*Phasis*, a river).—A family of birds belonging to the order *Gallinæ*, characterized by their having the hind toe placed higher on the tarsus than the front ones, so that only the tip touches the ground. Their bill is arched, and the nostril is covered with a vaulted, smooth, naked, horny scale. The tarsus is naked, and that of the male is generally furnished with one or more spurs. These birds are much sought after as food, and often domesticated for that purpose. They are at the same time often the most beautiful of the class. The male is generally the largest and finest coloured, and they are most usually ornamented with wattles, combs, or crests. The wings are generally short and rounded. The peacocks belong to this family, constituting a sub-family by themselves—see PAVONINÆ. The fowls form another sub-family—see GALLINÆ, and the turkeys a third—see MELEAGRIS. The pheasants are the typical species, however, and form the largest sub-family, *Phasianinæ*. They have the tail lengthened, the tail feathers narrowed and pointed, and the cheeks more or less naked. The species are found wild in various parts of Asia, but some of them have become naturalized in Europe. They feed on grain, seeds, roots, and insects. The type of this family is the genus *Phasianus*, and the typical species is the common pheasant, *P. Colchicus*, a bird which, though not a native of Great Britain originally, has now become perfectly naturalized. It is said to have been imported into Europe by Jason, from Colchis (the modern Mingrelia), where it was found by him on the banks of the river Phasis (the modern Faz). Several well known species of pheasants are natives of China. The beautiful golden pheasant, *Chrysolophus pictus*, and the handsome silver pheasant, *Gennæus nychthemerus*, are common in all our aviaries, and are too well known to need description. Reeves's pheasant, *Syrmaticus Reevesii*, is a third Chinese species, but is much rarer. It is a fine



Crossoptilon auritum.

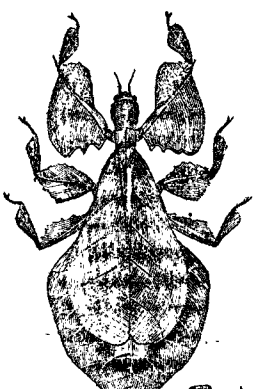
bird, and the male possesses a magnificent long tail. Two species occur in Japan: Diard's pheasant, *Phasianus versicolor*, and Soemmering's pheasant, *P. Soemmeringii*. The islands of Java and Sumatra produce a species also distinguished for its beauty. This is the fire-backed pheasant, or the Macartney cock, *Macartneya ignita*, and this species seems to lead the way from the true pheasants to the *Gallinæ*. The Impeyan pheasant is a beautiful species, a native of the Himalayas. See LOPHOPHORUS. The

species here figured is a rare and fine bird from Thibet, *Crossoptilon auritum*.

Phasianus. *The Pheasant.*—See PHASIANIDÆ.

Phasma (φάσμα, a spectre). See PHASMIDÆ.

Phasmidæ.—A family of insects belonging to the order *Orthoptera*, and containing a number of species very remarkable in the form of their body, which is usually elongated, round, and linear. They approach in general appearance the *Mantidæ*, but are distinguished from them by their fore legs being of the ordinary form and fitted like the rest for walking. In some, however, the body is flat and very broad, and the legs are provided with leaf-like appendages. The fore wings, or tegmina, in the phasmidæ are very small, but the true wings are frequently of large size, though, in many species, and in the females more especially, they are often altogether wanting. Those species which have the body long and slender, obtain from that circumstance the name of "spectres," and, as many of the genus *Phasma* are wingless, and bear a great resemblance to vegetable structures, they are well known by the name of "walking-sticks." The species which have the body flat and legs leaf-like (genus *Phyllium*) are called, from their extreme resemblance to green, or dry and withered leaves,



Phyllium—Walking Leaf Insect and Egg.

"walking-leaves." They are much rarer than the walking-sticks, and generally inhabit the East Indies. The phasmidæ live exclusively upon vegetables, and live solitary or in pairs, crawling slowly amongst the branches of low shrubs, and devouring the young glutinous or gummy shoots. Some of them are very destructive to palm trees, as the cocoa-nut tree, &c. The species here figured is a native of India; the egg resembles, and might easily be mistaken for a seed.

Philadelphaceæ. *The Syringa family.*—A nat. ord. of dicotyledonous plants, composed of shrubs, with deciduous, opposite, exstipulate leaves, without dots, and flowers usually in trichotomous cymes. They are natives of the south of Europe, of North America, Japan, and India. The type of the family is the genus *Philadelphus*. The greater number of the species of this genus are natives of North America, and their white flowers are generally sweet-scented. The best known species is the common syringa, *Philadelphus coronarius*, a shrub six to nine feet high, with white flowers disposed in corymbs at the extremities of the smaller branches, and possessing a peculiar odour which to some persons is overpowering. This shrub has been cultivated in all the gardens of Europe since the sixteenth century. The flowers appear in the end of May, and remain almost all the month of June. There are several varieties in cultivation.

Philander.—A genus of marsupial animals. See DIDELPHIDÆ.

Philanthus (φίλεω, to love; ἄνθος, flower).—A genus of insects belonging to the order *Hymenoptera*, and family *Crabronidæ*. They are characterized by their antennæ being widely separated at the base, suddenly swollen at the extremity, and their mandibles being one-toothed. These insects burrow in hot sandy situations, each hole consisting of a horizontal gallery slightly inclined, and sometimes nearly a foot long. They provision their nests with hive bees. The moment a philanthus perceives a bee come to settle upon a flower, it darts upon it, and seizing hold of it pierces its abdomen with its sting. After killing the poor creature it drags it to its nest, depositing an egg along with it, and as each female deposits five or six eggs it must destroy at least an equal number of bees. The larvæ are soon hatched, and feed upon this provision so carefully provided for them.

Philedon.—A genus established by Cuvier to contain a number of tenuirostral passerine birds, which are now divided amongst several genera belonging to the family *Meliphagidæ*.

Philemon.—A synonym of PHILEDON.

Philodromus (φιλοδρομος, a wanderer).—A genus of insects belonging to the class *Arachnida*, or spiders. The species have eight eyes, all nearly of equal size, in the fore part of the cephalothorax, and placed in two crescentic lines. They run with great swiftness, their feet being extended laterally to catch their prey. They spin a solitary thread to sustain themselves by, and conceal themselves in leaves, &c., in order to watch their prey.

Philomachus. *The Ruff.*—See SCOLOPACIDÆ.

Philomela.—A genus of birds containing the well known and universally admired songbird, the nightingale. See LUSCINIDÆ.

Philopterus (φίλος, a lover; πτερον, a wing).—A genus of apterous insects belonging to the order *Anoplura*, and family *Ricinidæ*. The species

are numerous, and are found living parasitic upon birds. Their food consists of the very minute portions of the feathers—hence their generic name.

Phleum.—A genus of monocotyledonous plants belonging to the sub-class *Glumaceæ*, and nat. ord. *Gramineæ*. The genus contains about twelve species of grasses, which are very common in the eastern parts of Europe and along the shores of the Mediterranean. One species, *P. pratense*, the meadow cat's tail grass, is of considerable importance in agriculture. It is a very common species in Great Britain, is a general inhabitant of the most fertile pastures, and is regarded as the sign of a rich soil. It is a very productive grass, is a very general component of hay, and is exceedingly useful when the object is to procure a sward of permanent herbage.

Phlomis.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, and containing a considerable number of species. Some, as *P. Lychnitis*, a shrubby plant, common in Spain and Italy, are cultivated in gardens. *P. tuberosa*, a herbaceous plant, growing in the eastern parts of Europe, has a tuberous root, which is eaten by the Calmucs of the Caspian after being reduced to powder.

Phlox (φλοξ, a flame).—A genus of dicotyledonous plants belonging to the nat. ord. *Polemoniaceæ*, and composed of herbs, for the most part natives of North America. They have simple, entire, sessile leaves, and generally purple or violet flowers. Several of the species are very much cultivated in garden borders, and thrive well in our climate. One of the most common, *P. paniculata*, is a native of Virginia and Carolina; it grows two or three feet high, is glabrous, and has numerous lilac flowers disposed in a panicle.

Phoca. *The Seal.*—See PHOCIDÆ.

Phocæna. *The Porpoise.*—See DELPHINIDÆ.

Phocidæ. *The Seal family.*—A family of animals belonging to the class *Mammalia*, and order *Ferœ*. The species belonging to this family are characterized by their limbs being short, and so enveloped in skin as to be more like fins than legs. Their neck is very short, so that the head appears united to the body; the nostrils are operculated, the animals possessing the power of opening or closing them at pleasure, and their head resembles in shape that of the dog. Their body is elongated and fusiform, the spine remarkably supple, and capable of extensive motion, and the tail very short. The teeth are those of the *Carnivora*, four or six incisives above, and two or four below, the canines pointed, and the molars twenty, twenty-two, or twenty-four, all cutting or conical, and without tubercles. The animals belonging to this family are all aquatic, and, as their external structure shows, pass most of their time and obtain their food in that element. They were known to the ancients from the remotest antiquity, and have been made by poets and others the subjects of a variety of fables—tritons, syrens, nereides, &c., the constant companions of Neptune in ancient mythology, have all derived their origin from members of the seal tribe; and even at the present day the fishermen on the coasts of the Mediterranean are embued with superstitious ideas regarding a tribe of supernatural people inhabiting the deep caverns and mysterious grottos so common on that romantic coast. The tales of mermaids too, have no doubt taken their origin from these animals. Seals are always found on rocky shores, and may be seen creeping up on to the rocks to feed their young and bask themselves in the sun. They never eat their food on land, however, but always seek for it and devour it in the water. They are polygamous animals, each male having three or four females, and they thus form small families. They generally have a layer of fat, which affords a good deal of oil, and several species have a fine close fur, which is very useful in making articles of clothing, caps, &c. In America the natives use the skins of some of the larger species made into bags, which are carefully closed all round and then distended with air. Half a dozen of these bags they lay upon rushes or straw, attach them by ropes, and form them into small light canoes, embarked upon which they do not hesitate to undertake long voyages down their rivers or on their large lakes. The Kamtschatkadales eat the flesh as their ordinary food. The seal fishery is one of considerable importance to Great Britain and the United States of America. The oil obtained is imported into Europe, but the skins are chiefly taken to the Chinese market, where they fetch a good price. The species are numerous, and are arranged in several sub-families. Some have their grinders divided into roots at the base, the soles of the feet are hairy, and they have simple toes armed with sharp claws. Such are the genera *Stenorhynchus*, *Calocephalus*, &c. Others have the grinders simple at the base, such as the walrus, *Trichecus;* the elephant seal, *Morunga;* and the sea-lion, *Otaria*. The common seal, *Calocephalus* (*Phoca*) *vitulinus*, is the best known species in this country. It is found abundantly over all the seas of Europe, but more especially in the northern seas. In spring, at which time they are fattest, a full grown seal will yield eight to twelve gallons of oil, which, if extracted before putrefaction has commenced, is beautifully transparent, free from smell, and not unpleasant to the taste. The skin when tanned is extensively used for making shoes, and when dressed with the hair on serves for covering trunks, &c. Another species, *Calocephalus Groenlandicus*, is found in the Frozen Ocean, in Greenland, Newfoundland, &c.; and to the Greenlander and Esquimaux this animal is all in all—it gives them light, food, and clothing. Its flesh forms their usual food, the fat is partly dressed for eating, and partly consumed in their lamps,

and the liver, when fried, is esteemed, even among sailors, as an agreeable dish. The skin is dressed by a process peculiar to themselves, so as to be waterproof. With the hair off it is used as coverings, instead of planks, for their boats,

Phoca (Calocephalus) vitulina—Common Seal.

and as outer garments for themselves, shielded with which they can invert themselves and canoes in the water without getting their bodies wet. In the arctic regions seals in fine weather prefer the ice to the water, and vast herds of them are frequently found lying on the field-ice; the places where they are met with being thence called "seal meadows." The poor animals are here attacked by the sealers and slaughtered in vast numbers. The sea-leopard, *Stenorhynchus* (*Leptonyx*) *Wedellii*, is a remarkable species, inhabiting the frozen seas of the high southern latitudes, in the seas about the South Shetlands, &c. The monk seal, *Pelagius monacha*, is a native of the Adriatic Sea and coast of Sardinia. It is a species capable of being easily tamed and domesticated. It appears to be very intelligent, docile, and affectionate, obeying the calls of its master like a dog. The elephant seal, *Macrorhinus* or *Morunga proboscideus*, is a very large species, its length being from twenty to twenty-five or thirty feet, and its circumference from fifteen to eighteen. The male is remarkable for the prolongation of its muzzle into an erectile, soft, elastic snout, about a foot in length, and which appears to be more visible at the breeding season. It is found on the shores of the desert isles of the southern hemisphere, in the antarctic seas, and upon the southern coasts of Australia, &c., &c. They live in troops of from 150 to 200 individuals, and they appear to emigrate to the north during winter, and return to the southern latitudes during summer. They yield a large quantity of oil, and their skin is so strong and thick as to be used in harness-making. The sea-bear, or fur seal, *Arctocephalus ursinus*, is about five or six feet long, and inhabits the North Pacific Ocean, abounding in spring and summer on the coasts of Kamtschatka and the Aleutian Islands. It is the skin of this species which is so much esteemed for its fur by the Chinese. A few bones have been found fossil, belonging to a species nearly allied to the common seal. The walrus, or morse, *Trichecus Rosmarus*, is remarkable for its two large canine teeth or tusks in the upper jaw, while the lower jaw has neither incisives nor canines. It is a large animal, from ten to fifteen feet in length, and even sometimes in old males reaching the length of twenty feet, and a girth of upwards of ten. The tusks measure from fifteen to thirty inches in length, and weigh from five to ten lbs. It is a native of the Northern Ocean and North Pacific, and appears to feed chiefly on sea-weeds. It is rather a fearless animal, and harmless, unless attacked. Great numbers are killed for the sake of their tusks, the ivory of which is highly esteemed. They do not yield a large quantity of oil, but it is more valued than that of the whale, and the skin is found very serviceable for carriage braces, good wheel ropes, &c.

Phocomeles (*φωκος*, a seal; *μιλος*, limb). —A genus of monsters. See Ectromelii.

Phoenicopterus (*φοινικος*, red; *πτερον*, a wing). *The Flamingo.*—A genus of birds belonging to the order *Anseres*, and family *Anatidæ*. Their distinctive characters are: a thick bill, higher than broad, provided with a membrane at its base, the edges furnished with very fine, small, transverse plates; nostrils straight, longitudinal, hollowed out in a furrow, and the animal having the power of closing them at pleasure by means of an opercular membrane; limbs excessively long, the three anterior toes palmated to the tip, the posterior one being free, short, and only touching the ground at its extremity; a long neck corresponding with the length of the limbs. About four species are known, all of them remarkable for the very red colour which they exhibit in some part of their plumage. They are from this circumstance called flamingoes. They are natives of Europe, Africa, and South America, and live in the marshy grounds on the sea shores, or on the banks of salt lakes and lagoons. Though their feet are palmate they do not live so much in the water as on land, or rather in the mud. They dwell in society, and seek their food, which consists essentially of worms, molluscs, eggs of fishes, &c., in large flocks, drawn up in regular file, which, with their bright red wings, has caused them often to be mistaken at first sight for a

squadron of soldiers drawn up in military array. They are very wary birds, and are said to place a sentinel to give warning to the rest of the flock, which he does by giving a shrill cry, not very unlike the sound of a trumpet. According to many travellers the flesh of the flamingoes is very good eating, though some maintain that it is rank and oily. The ancients used it as food, but, according to the accounts handed down to us of the time of Heliogabulus, it was the tongue which was the part preferred. The common flamingo, *P. ruber*, is the species found in Europe, and the plumage is throughout of a fine rose colour. The European habitats are the borders of the Mediterranean, though it is also found in Africa and Egypt. The two South American species are *P. Bahamensis* and *P. ignicapillus*, the first being found in tropical America, and the latter in Patagonia and on the west coast of America. The African species is *P. minor*, and extends from the Cape of Good Hope to Senegal.

Phoenix. *The Date Palm.*—A genus of monocotyledonous plants belonging to the nat. ord. *Palmæ*, and containing those trees so well known as the date palm trees. There are nine or ten species all belonging to the Old World, two being peculiar to tropical and Southern Africa, six to tropical Asia, and one common to North Africa and Western Asia. They are all plants with a tolerably thick stem, and thick, close-set, pinnate leaves, many of them provided with long, hard spines at their base. The male flowers are carried by one tree and the females by another, and the fruit is a sort of berry covered with a firm and sugary flesh, the kernel being oblong and profoundly furrowed. The most important species belonging to the genus is the date palm, *P. dactylifera*, which appears to grow spontaneously on Mount Atlas, several parts of North Africa, and in Arabia. It is cultivated to a great extent in North Africa, from Senegal and Abyssinia to the banks of the Mediterranean, and in Asia, from Asia Minor to Southern Persia. The date tree grows to a height of sixty feet, and it throws out numerous thick roots from the lower part of the stem, which fix it solidly to the ground. In old trees, the trunk for some part of its extent is bare of leaves, but is marked with transverse ridges produced by the falling off of the bundles of fibres carried by the leaves. The fruit is fleshy, oblong, of a golden-yellow, the pericarp of which is very thick, and preserves easily by drying. The agreeable taste and the nutritive qualities of the date, and the utility of the tree in other respects, have caused it to be cultivated most extensively in all quarters where it will grow, and now its range of growth has extended to the south of Europe, Spain, Italy, and Greece. In the more northern parts of Europe, however, where they are cultivated, the fruits do not ripen, and it is only the leaves that are used, being carried in the processions on Palm Sunday, &c., in Catholic countries. The dates are pulled before they are quite ripe and are then dried in the sun. When perfectly ripe, fermentation takes place easily, and a kind of brandy is extracted from them. Dates, fresh or dried, form one of the chief parts of the usual food of the Arabs, especially during their journeys across the desert, whilst the seeds or nuts softened and ground down, form the nourishment of their camels and oxen. The sap which flows from the tree can also be collected, like that of other palms, and made into palm wine. The leaves are employed for making mats, the threads of the web-like integument at the basis of the leaves are twisted into ropes, and the stems, when old, are sufficiently hard to be used in the construction of their houses. The wood of the tree, however, is of little use. The date tree is the palm tree of Scripture, and was emblematic of Judæa, as we see in coins with the inscription of *Judæa Capta*. Palmyra or Tadmor in the desert, built by Solomon, derives its name, it is said, from the presence of this tree in its immediate neighbourhood; the latter name, which is the most ancient, being derived from "Tamr," a date. In the Arab language, the date, or different parts of it, and at different ages, is said to have 300 names applied to it.

Pholadidæ (φολεω, to burrow).—A family of molluscous animals belonging to the class *Conchifera*, and containing several genera and many species, the greater number of which are burrowing shells, penetrating rocks, wood, &c. They are natives of all climates. Those belonging to the genus *Pholas*, besides having two regular valves, possess at the hinge several accessory pieces. They are often of considerable size, white, rough, and hard, but very brittle, a circumstance which renders it still more curious how they can penetrate the hard rocks. This power which shells have of penetrating hard calcareous rocks, wood, resin, and other substances in which we find these brittle shells, is not quite well understood, but it is generally believed now that it is by a rotatory motion of the shell itself that the effect is produced. One or two species, as the date shell, *Pholas dactylus*, are eaten on the coasts of the Mediterranean. *P. candida* is used for bait on the Devon coast, and *P. costata*, a large West Indian species, is sold in the market of Havanna as an article of food. About twenty-five recent species of the genus have been described, and an equal number are found fossil.

Pholas. See PHOLADIDÆ.

Phonolite (φωνεω, to sound).—A mineral, better known under the name of clinkstone. It is of a grayish-blue colour, is composed of felspar and zeolite, and yields a metallic sound when struck by a hammer, hence its name. It occurs in volcanic districts. As it contains alkali when decomposed, it yields a fruitful soil. Its specific gravity is 2·55.

Phonygama.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Sturnidæ*. The genus has also been described under the name of *Manucodia*. The birds belonging to this genus are remarkable for the conformation and structure of their trachea. It curves just at the sternum, and descends towards the abdomen, where it forms loops, and folds itself three times in a circle before remounting to reach the neck and unite itself to the branches of the os hyoides and tongue. In consequence of this formation, these birds, like the swan, possess a powerful voice, musical, and capable of being modulated like a horn. The sounds which they emit in the dense forests of New Guinea, where they are found, distinguish it at once from all other birds. It is clear, sonorous, and distinct, passing successively through all the notes of the gamut. They are solitary birds, live on fruits, and are very wild.

Phoraspis.—A genus of insects. See BLATTIDÆ.

Phormium.—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, and composed of a single species, *P. tenax*, a native of New Zealand, which yields the fibre known as the New Zealand flax. It is a fine large plant, with a fleshy tuberous root, and numerous radical leaves from three to six feet long, of a bright shining green above, white underneath, and of a very tough consistence. It bears numerous, showy, yellow flowers. This handsome plant was discovered by Sir Joseph Banks during Captain Cook's first voyage. It abounds in New Zealand. The leaves furnish the natives of that country with a fine, silky, but strong, tough flax, from which they manufacture some of their best stuffs. The fineness and strength of this kind of flax, has caused it to be introduced into Europe, and the plant itself has been attempted to be cultivated in France, in the south of which, especially in Provence, it has succeeded tolerably well. Numerous experiments have been instituted to test the tenacity and extensibility of this kind of flax, and the result of these when compared with some other substances is this: hemp may be placed as $16\frac{1}{2}$, flax $11\frac{3}{4}$, phormium $23\frac{5}{17}$, and silk 34; thus showing its superiority over all these substances except silk. It has been found, however, that cordage and other substances manufactured from it, do not stand the action of heat and moisture combined. One or two washings injure the articles manufactured, and the cables, &c., made from it cannot withstand the alternate action of fire and water. This has been accounted for by chemists, who assert that the fibres of the phormium present intersections of albuminous substances, and when these are attacked by moist, heat, and alkalies, a rapid disintegration of the fibres takes place.

Phorus (φορεύς, a carrier). *The Carrier Shells.*—A genus of molluscous animals belonging to the class *Gasteropoda*. The animals inhabiting the shells of this genus are not very well known, so that their exact place amongst the gasteropods is not yet distinctly ascertained. They are placed by Dr. Gray, however, in the rostriferous group of the order *Pectinibranchiata*, and form the type of a small family, *Phoridæ*. The shells are trochiform, concave beneath, and the whirls are flat with foliaceous or stellated margins. To the outer surface of these, the animals have the peculiarity of attaching stones, fragments of other shells, corals, and other marine substances, from which circumstance they are known by the name of "conchologists" and "mineralogists." Some species have this habit only in early life, others retain it during the whole period of their existence. Nine recent species are known, inhabiting East and West Indies, China, the Philippine Islands, and West America. About fifteen fossil are found in the eocene formation.

Phragmites (φραγμα, a hedge).—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*. The genus was established to receive a species of reed, separated from the genus *Arundo*, to which it formerly belonged, but from which it differs in its inflorescence. This plant, the common reed, *Phragmites communis* (*Arundo phragmites*), is a useful plant to man. It is tall and strong, and cosmopolitan in its growth, being very common in this country and all throughout Europe, in Siberia, Japan, North America, and Australia. In all these countries it grows exclusively in places overflowed with water, forms thick coverts, and yields an abundance of durable grass of great value for the purpose of thatching the roofs of buildings. The roots were considered to possess sudorific and diuretic properties, and the panicles of flowers produce a fine green colour which has been employed in painting.

Phragmoceras (φραγμα, a partition; κερας, a horn).—A genus of fossil cephalopods. See NAUTILIDÆ.

Phronima.—A genus of *Crustacea* belonging to the order *Amphipoda*. Two species are known, natives of the Mediterranean and British seas, and living parasitic in the bodies of medusæ, pyrosoma, and beroe.

Phryganeidæ.—A family of insects belonging to the order *Trichoptera* of some entomologists, and containing those curious species known by the name of caddice-flies. They were formerly contained in the order *Neuroptera*, but they differ from the other insects of that order by their wings being destitute of reticulations, and by their undergoing a complete metamorphosis. The wings are membranous, the anterior hairy and having branching nerves, the posterior larger and well developed, and folded when at rest. These flies live in marshy places, keeping always close to the edges of ponds, from whence they may be seen, in the fine summer evenings,

to issue in great swarms. They are found in all parts of the world. Their larvæ are aquatic, and may be known by their possessing on the sides of the body a number of external respiratory sacs. They generally reside in cylindrical cases, open at each end, which they construct for themselves and cover externally with pieces of broken shells, gravel, bits of wood, &c. Some of the species carry these tubes about with them, others construct immovable ones. When about to change into the pupa state, they fasten the tube to some fixed substance beneath the water, and close the two extremities with an open work fence, thus admitting a current of water, and allowing the pupa to respire. The species are numerous, and the larvæ are the *Cad-bait* of the angler.

Phryniscus.—A genus of batrachian reptiles, to which the Bahia toad, *P. nigricans*, belongs. This is a small animal of a very black colour above, and bright vermilion beneath. Unlike the other species belonging to the *Batrachia*, this toad lives in dry, sandy situations, and crawls about during the heat of the day.

Phrynocephalus (*φρυνος*, a toad; *κεφαλη*, head).—A genus of saurian reptiles belonging to the family *Iguanidæ*. The genus contains only a few species, which are natives of the neighbourhood of the Caspian Sea, Southern Siberia, and Turkey in Asia. *P. auritus* is the best known species, and is remarkable for having the angles of the mouth furnished with a short membrane dentilated at its free margin.

Phrynosoma (*φρυνος*, a toad; *σωμα*, body).—A genus of saurian reptiles belonging to the family *Agamidæ*. It comprises two or three species remarkable for their bizarre forms. They are natives of North America, from the fortieth degree to Mexico, and are repulsive looking creatures resembling toads. For a further account of these animals, see AGAMIDÆ.

Phrynus.—A genus of annulose animals belonging to the class *Arachnida*, and family *Phrynidæ*. The species are natives of the warm countries of America and Asia. Several are found in the Island of St. Domingo, in old decayed trunks of trees, and are said to be the terror of the negroes.

Phtanite.—A species of rock composed of quartz, combined with a small quantity of talc. It possesses a variety of colour, green, brown, red, and black. The black variety is used by lapidaries as a touchstone.

Phthirius (*φθειρ*, louse).—A genus of parasitic insects, distinguished by their thorax being broad, and not distinct from the abdomen, which consists of eight segments. The anterior feet are slender, fitted for walking, and not cheliform. There is only one species, *P. inguinalis*, which lives parasitic upon man, being generally found on the pubis.

Phycis (*φυκος*, sea-weed).—A genus of malacopterygious fishes belonging to the family *Gadidæ*, characterized by their ventral fins having only a single ray which is frequently forked. The species are fishes with a large head, their chin is furnished with a barbule, and they have two dorsal fins, the second of which is the longest. *P. furcatus*, the forked hake, or fork beard, is found on the Cornish coast, is about two feet in length, and is indifferent eating. *P. Mediterraneus* is a common species in the Mediterranean, where it is called the sea tench, and is about two feet long. It is considered delicate eating.

Phycoideæ (*φυκος*, alga).—A synonym of FUCI.

Phycologia (*φυκος*, sea-weed; *λογος*, discourse).—That portion of botanical science which treats of that large order of acotyledonous plants called *Fuci*, or sea-weeds.

Phyllanthus (*φυλλον*, a leaf; *ανθος*, a flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*. The genus contains several species, some of which are trees, others shrubs, and some herbs, and which are found in the tropical and sub-tropical parts of the world, more especially, however, in America. There are two species, *P. urinaria* and *P. virosa*, growing in Brazil, and known under the name of "conami." They are used by the natives for intoxicating and stupefying fishes.

Phyllinidæ.—A family of worms. See ANNELIDA.

Phyllodium (*φυλλον*, a leaf; *ειδος*, form).—An enlarged petiole, which becomes a substitute for a leaf, such as we see in some of the Australian acacias, and several other plants, in which the leaves are not developed, and this peculiar petiole takes their place. See ACACIA.

Phyllomorphus (*φυλλον*, a leaf; *μορφη*, form).—A genus of hemipterous insects. See COREIDÆ.

Phyllophaga.—A tribe of beetles. See SCARABÆIDÆ.

Phyllopoda (*φυλλον*, a leaf; *πους*, a foot.)—An order of crustacean animals belonging to the division *Entomostraca*. The animals of this order of entomostraca are generally provided with numerous feet, which are foliaceous in structure, branchiferous or gill bearing, and thus adapted more for respiration than locomotion. The body is generally divided into numerous segments. This order contains, with the exception of the limuli, the largest individuals of all the entomostraca, and many of them the most remarkable for beauty. In some, the body is either entirely or partially covered with a carapace or shell, while in others, it is completely naked. In those in which the body is entirely covered, the carapace has the exact form of a bivalve shell, and they have often been mistaken for *Mollusca*. These constitute the family *Limnadiidæ*, the species of which inhabit fresh water ponds and ditches. In those only partially covered, some have the carapace bivalve-shell-shaped, and have, in addition to the branchial

feet, which are only about eight pairs, a series of members adapted for swimming. These constitute the family *Nebaliidæ*, the species of which are inhabitants of the sea. Others have the carapace in form of a large convex buckler which covers the upper part of the body; the feet are very numerous, about sixty pairs, the first pair only of which are adapted for locomotion, the tenth pair for containing the ovary, and all the others branchial. These constitute the family *Apodidæ*, consisting of the genera *Apus* and *Lepidurus*, the species of which inhabit fresh water ponds. In those which are entirely destitute of a carapace or covering, the body is long and slender, and the feet are eleven pairs, all branchial. The males possess a curious and somewhat complicated apparatus attached to the head, in place of antennæ, and the organ of locomotion consists of a tail, shaped somewhat like that of a fish. These constitute the family *Branchipodidæ*, some of which, as *Chirocephalus*, inhabit fresh water ponds and ditches, and are remarkable for their beauty, whilst others, as *Artemia*, live only in salt marshes, or in the strong brine of salt works. See ARTEMIA and CHIROCEPHALUS.

Phyllosoma (*φυλλον*, leaf; *σωμα*, body).—A genus of *Crustacea*. See STOMAPODA.

Phyllostoma (*φυλλον*, leaf; *στομα*, mouth.)—A genus of animals belonging to the class *Mammalia*, order *Primates*, and family *Vespertilionidæ*. The species are known as the leaf-nosed bats. They have the nasal disc expanded into a distinct leaf, which is simple behind, and pierced with the nostrils in front. They are peculiar to warm climates.

Physa (*φυσα*, a pouch).—A genus of pneumobranchiate gasteropodous *Mollusca* belonging to the family *Lymnæidæ*. The species are inhabitants of the fresh water, and are found in all the four quarters of the globe. The shells are small, ovate, delicately transparent, and polished, all sinistral, and the animals have the edge of the mantle produced, fringed with long filaments, and reflexed over the shell when expanded. About twenty recent species are known, of which three or four are natives of Great Britain, and about fourteen fossil species are found in the wealden.

Physalia (*φυσαλις*, a bubble in the water). *Portuguese Man-of-War.*—A genus of animals belonging to the class *Acalepha* and order *Physograda*. There are several species belonging to the genus, which are found floating, often in considerable numbers, on the surface of the ocean within the tropics. The common Portuguese man-of-war, *P. Atlantica*, may be taken as the type of the genus. The animal consists of a large irregular vesicle filled with air, from the under surface of which depend numerous, diversiform, cirrhous tentacula, which possess the stinging qualities of the *Medusæ*. The upper surface of the air vessel is in form of an oblique and wrinkled, elevated crest, the summit being generally of a beautiful rosy hue, while the extremity is of a fine purple colour. They are found in the seas of warm latitudes, often in great numbers, floating gently along on the surface of the sea when smooth, the crest acting in some measure as a sail. The tentacula vary much in length as well as in form, some of them hanging down like fishing lines to an extent of fifteen or sixteen feet, and they are very contractile, being adapted for drawing up the prey which they may have succeeded in grasping. They are of a very pretty violet and blue colour, intermixed with purple, and appear to possess the power of contracting and dilating the æriform vesicle at pleasure. They are brightly luminous at night.

Physalis (*φυσα*, a bladder; the inflated calyx resembling a bladder).—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*. The genus is composed of herbs or under-shrubs growing abundantly in Asia, Africa, and tropical America, but rarely in northern and temperate regions. *P. alkekengi*, the winter cherry, is a native of central and northern Europe, and of Japan. It is an herbaceous downy plant, with flowers of a pale yellow or white colour, and the berries which succeed them are of a fine red hue, presenting very much the appearance of cherries; hence their English name. They are acidulous, slightly refreshing, and diuretic. In France they are employed in the manufacture of the syrup called "Sirop de chicorée." *P. somnifera* is somewhat shrubby, and grows in rocky places in the south of Europe and the East Indies. It grows also in Egypt, and is said to have been used by the natives of that country in embalming the dead. It appears to have the effect of preventing the attacks of insects, and is said to be narcotic and diuretic. The berries of *P. pubescens*, or the downy winter cherry, an East Indian and North American plant, are called in these countries gooseberries, are used as a substitute for them, and when preserved with sugar make an excellent sweetmeat.

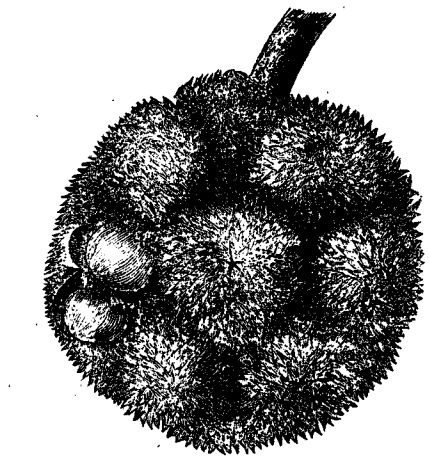
Physeter. *The Sperm Whale.*—See CATODONTIDÆ.

Physograda.—An order of ACALEPHA.

Physomycetes.—An order of acotyledonous plants belonging to the nat. ord. *Fungi*, composed of microscopic plants of very simple organization, the mycelium being a byssoid or flocculent mass, bearing simple vesicular sporanges filled with minute spores.

Phytelephas (*φυτον*, a plant; *ελεφας*, ivory). *Vegetable Ivory.*—A genus of monocotyledonous plants belonging to the nat. ord. *Palmæ*. The species possess pinnated fronds and erect stems, and the fruit consists of quadrilocular drupes, which are aggregated into a large, muricated, coriaceous head. The seeds are about the size of a pigeon's egg, and of an oblong, ovate, triangular shape. When young they contain a crystalline liquor without odour or taste, which is

regarded as a refreshing drink by travellers. As they become ripe, this liquid becomes milky and opaque, and at last is converted into a substance as hard as ivory. The seeds of *P. macrocarpa*, the Taqua nut, or vegetable ivory, a native of South America, on the borders of the river Magdalena, are imported into this country in considerable quantity for the purpose of being used in



Phytelephas macrocarpa—The Vegetable Ivory Nut.
[From a specimen of this plant in the British Museum.]

the place of ivory. The natives of the districts where the tree grows, were in the habit from time immemorial of using this vegetable ivory, for making buttons, heads to walking-sticks, &c., but it is only within a recent period that it has been used in Europe. It is now extensively employed, and is much less expensive than it was, but does not retain its colour well. It consists of cellulose, gum, caseine, with a little oil and albumen.

Phytodecta. — A genus of beetles. See CHRYSOMELIDÆ.

Phytolacca.—See PHYTOLACCACEÆ.

Phytolaccaceæ.—A nat. ord. of dicotyledonous plants, containing a number of herbs or under-shrubs, with alternate, entire, often dotted leaves. The species are natives of tropical and hot countries, being found in America, Asia, and Africa, and many of them are remarkable for the acrid nature of their juices, which causes them to act as irritant emetics and purgatives. The genus *Phytolacca* is the type of the family, and contains about a dozen species, one of which, *P. decandra*, the common poke, or American grape, is a plant from six to twelve feet high, with a succulent stem, and a thick branched root. The leaves are glabrous, of a fine green colour, and the flowers are rose or violet-purple, succeeded by a berry of a violet-black. It is a native of the United States, but is now naturalized in various parts of Europe. The berry yields a red juice, which is used in some countries for colouring wine. The roots possess a drastic property, and have been used in cases of chronic syphilitic pains. The young shoots, however, of this plant are eaten by the natives of America and the West Indies as a vegetable, and in Austria the plant is cultivated for this purpose. The genus *Petiveria* is another genus belonging to this family. See PETIVERIA.

Phytophaga (φυτον, a leaf; φαγω, to eat). —An order of gasteropodous *Mollusca*, containing those species which live chiefly on vegetable food.

Phytophagidæ. — A tribe of coleopterous insects, containing those beetles which live upon vegetables.

Phytotoma (φυτον, a leaf; τεμνω, to cut). *The Leaf Cutters.*—A genus of birds belonging to the conirostral tribe of the order *Passeres*, family *Fringillidæ*, and forming the type of a small subfamily, *Phytotominæ*. The conical bill of the birds of this genus is provided with a kind of tooth at its base, and is irregularly dentated on its edges. The wings are short, and the tail rounded at the extremity. Contrary to the usual form of phytophagous birds, the *Phytotomæ* have a short intestine. They live upon vegetable food, and unfortunately, in selecting the plant, they cut it off with the beak close to the roots. They live in retired woods, and build their nests on the highest trees. *P. rara* is the type of the genus, is the best known, and is a native of Chili, and other parts of South America.

Pica.—A genus of birds containing the magpie. See CORVIDÆ.

Picidæ. *The Woodpeckers.* — A family of birds belonging to the order *Scansores*. The birds of the family are distinguished by having a wedge-shaped bill with a hard point, and the sides compressed near the tip. The tongue is remarkably long, narrow, capable of being extended beyond the beak, barbed at the tip, and covered with a glutinous secretion. The feet are unusually strong, the nails broad and crooked, and the toes placed in pairs, two behind and two before; a structure which constitutes them the most perfect of all the climbing birds. The genus *Picus* is the type of the family, and contains many species, which are all remarkable for their scansorial powers, being able to run up or down a tree with equal facility. In this their tail materially assists them, being formed of hard resisting feathers, sharp pointed and bent inwards. In general they are of solitary habits, and live in forests and on high trees. Few of the species are marked by any song or cry, but they have a peculiar habit of striking forcibly their hard beaks against the trunks of old trees, and making such a sound as can be heard at a great distance. Their chief or only food consists of insects either in the perfect or larva state,

which they seek for under the bark of trees or in holes in their substance. When thus searching for their food they may be seen fixing themselves by their strong claws to the trunk of the tree, and then pressing their tail, with its hard, sharp pointed feathers, against it, make it act as a support. Their long tongue is then thrust into all the crevices of the hole where insects are likely to be found; and if they cannot reach them, they open the hole still farther by means of their beak. They generally build their nests in holes which they either find in the trunks of old trees or which they make for themselves. It is commonly imagined that these birds are destructive to trees by their making these holes in them, but on the contrary it appears that they do more good than harm, as they destroy an immense number of insects which are in reality much more injurious to the trees than they are. It is said, too, that they seldom select a sound tree to construct their nest in, but usually prefer one that is old and decaying. The species are scattered over all the world, and are rather numerous. From some slight differences existing in them they have lately been arranged in a considerable number of sub-genera. Some of them have only three toes, as *P. tridactylus*, the three-toed woodpecker, which forms the type of the genus *Picoides*. It is a European species, inhabiting the vast forests of the northern parts of Europe, Asia, and America. Besides insects, it adds wild fruits as part of its food. Most of them have four toes, however, and of these some have a straight bill with a carinated ridge. Such is the greater spotted woodpecker, *P. major*, the type of the genus *Dryobates*. This bird is also European, and is perhaps more extensive in its distribution than any other species of woodpecker. It is found in Great Britain, in the north of Europe as far as to Russia, in the south as far as Italy, and is common in Smyrna. In its habits it is shy and recluse, and they are so active among the branches of the trees upon which they are generally found, as seldom to allow themselves to be seen. The favourite localities of this species are large woods and well-timbered parks, and it has occasionally been seen in Kensington Gardens. *P. minor*, the lesser spotted woodpecker, is the smallest of all the European woodpeckers, and is common in England, wherever well timbered parks, orchards, &c., abound. From its habit of frequenting the topmost boughs it is not often seen, but if looked for may be found common enough in the neighbourhood of London, as in Kensington Gardens, and elsewhere. *P. viridis*, the green woodpecker, is the type of the genus *Gecinus*. It is a European species, and occurs generally throughout England where there are woods. This bird finds its food both on the ground and on trees. In the former situations it is seen in the neighbourhood of ant-hills, eagerly devouring ants, and in the latter position it may generally be seen to alight low down on the bole of the tree, and work its way upwards, tapping the bark with its bill as it ascends. The black woodpecker, *P. martius*, is the type of the now limited genus *Picus*. It is the largest and the rarest of all the species seen in Britain. It is sixteen inches in length, and the plumage is deep black. It is chiefly in the north of Europe and in Siberia that this species is found, and it lives in secluded woods. A good many species are exotic, being found in Asia, Africa, and America. The ivory-billed woodpecker, *P. principalis*, is the type of the genus *Campephilus*. It is a fine species of a black

Campephilus imperialis—Imperial Woodpecker.

colour, with a gloss of green, about twenty inches in length, thirty in extent, and is a native of Brazil, Mexico, and the southern states of North America. There it lives in the lonely forests amidst trees of the greatest magnitude, and travellers describe it as having a loud trumpeting note like that of a clarionet, which it sends forth in the early morning, and which, along with the resounding noise of his strong and ivory-looking bill striking against the stem of the tree, are often the only sounds to be heard in the deep forests of these countries. It lives chiefly upon insects, and so industrious is it in its search after them that in an hour or two it will hew out of a tree a bushel of chips; hence it has obtained the name of "carpentero," the carpenter, from the Spaniards. The Indians set a high value upon the bills of this bird, and make coronets of them

for their princes and great warriors by fixing them round a wreath with their points outward. *Campephilus imperialis*, the imperial woodpecker, is an allied species from the United States of America, and is the species we have selected for illustrating this interesting family,

Picoides.—A genus of woodpeckers. See PICIDÆ.

Picumnus.—A genus of scansorial birds belonging to the family *Picidæ*, or woodpeckers. They differ from the true woodpeckers by having the tail short, with the end rounded, soft, and held elevated like the wren's. The species are natives of South America and India.

Picus. *The Woodpecker.*—See PICIDÆ.

Pieridæ.—A sub-family of insects belonging to the diurnal *Lepidoptera*, and family *Papilionidæ*. The butterflies belonging to this group are characterized by the hind wings forming a gutter for the reception of the abdomen. There are several genera contained in it, of which *Pieris* may be taken as the type. The prevailing colour is white, orange, or brimstone. *P. crataegi*, the black-veined white or hawthorn butterfly, is an elegant species, the wings being white, with black nervures, and bordered on their outer edges with irregular, dusky spots. It has been called, on the continent, the pest of gardens, from the larvæ destroying fruit trees, but in this country it is rarer, and only found on the hawthorn. The species composing the genus *Pontia* are also contained in this sub-family. *Pontia brassicæ*, the cabbage butterfly, is very common, and the caterpillar is often exceedingly destructive to cabbage plants and other garden vegetables. Indeed, so prolific is this species, that were it not for the ichneumon fly, which deposits her eggs within the body of the caterpillar, and in the larva state continues to prey upon its vitals, the ravages it commits upon our vegetable productions would be of very serious consequence. The orange tip, or wood-lady butterfly, *Pontia cardamines*, is another very common species in this country. The caterpillar is green, and feeds upon the *Cardamine*, wild cabbage, &c.

Pinna (*pinna*, a fin, or wing).—A genus of molluscous animals belonging to the class *Conchifera*, and forming the type of a small family *Pinnidæ*. The shells belonging to this genus are longitudinal, wedge-shaped, equivalve, gaping at the posterior extremity, and pointed anteriorly where the hinge is situated. They are generally very brittle, and some of them are of great size, being two feet in length. They live sunk in the sand, moored vertically, their gaping end just above the surface, and attached by means of a byssus to rocks, stones, &c., at the bottom of the sea. The species of the Mediterranean, especially *P. squamosa*, have a very thick and abundant byssus, of a fine silky composition, and a brilliant brown colour. At one time it is said that this substance was employed in the manufacture of silk stuffs, but at present it is only employed for being knitted into gloves &c., as objects of curiosity. About thirty recent species are known, which are found in the seas of Europe, America, Australia, and in the Pacific. Some of them are edible. About fifty species are found fossil in the Devonian, &c.

Pinnotheres (πίννα, the shell pinna; θήρ, animal). *The Pea Crabs.*—A genus of decapodous short-tailed *Crustacea*, belonging to the family *Cutometopa*. The carapace in this genus is nearly of a circular form, with the front narrow. The abdomen of the male is small, that of the female extremely broad, round, and prominent. The pea crabs are the smallest of all the short-tailed crustacea, and are peculiar from the fact that they are always found to inhabit the shells of living bivalve mollusca. The males are much smaller than the females, and have a hard crust or shell, whereas in the females it is remarkably soft. The females are more abundant than the males. They are found in the shells of the common mussel, the horse mussel, cockle, and oyster, &c. One species inhabits the large pinna of the Mediterranean, and was known to the ancients, who believed that a mutual friendly relation existed between this little crab and its host; that the little crustacean warned the pinna of impending danger, while it in return sheltered the little pea crab from the attacks of its enemies. A species of pinnotheres was known to the Egyptians, and is figured in their hieroglyphics. The young animal, at its birth, differs very much in appearance from its parent, and undergoes considerable changes before it acquires its perfect form.

Pinus. *The Pine Trees.*—A genus of gymnospermous dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Abietineæ*, and forming one of the most important genera, in a commercial point of view, that we possess. The species are trees, which form by far the greater part of the large forests of the northern hemisphere. About fifty species have been described and are found distributed over various parts of Europe and North America, some also being found in Asia. Though a few of them are small little more than low bushes, yet the majority are lofty forest trees, with branched, usually resinous trunks, and evergreen, linear-subulate leaves springing in groups of pairs, threes, fours, fives, from sheaths formed by dry scales. They are monœcious plants, the male and female flowers growing on separate branches, and the fruit is a cone, or strobilus, composed of imbricated scales. They are divided into groups (sub-genera of some botanists), according as the leaves are arranged in twos, threes, or more in a group, and as the cone, or strobilus, is formed of thick woody scales, angularly dilated at the apex, or plane, convex on the dorsal surface, and sharp pointed at the apex. One of the best known species is the common or stone pine *P. Pinea*, a straight tree, with brown cracked

bark; thick, rather long leaves, growing in pairs; long ovoid swollen cones, and a stem rising to the height of sixty feet. It is a native of all the southern parts of Europe, and of the Levant. The stem is naked, and terminates in

Cone of *Pinus sylvestris*.

a fine large cyme of branches, which spread out horizontally. The seeds contained in the cones are of a pleasant flavour, and in the Mediterranean regions are used by the natives as an article of food, and eaten either by themselves or mixed with other substances. The timber is inferior to several other species, but is notwithstanding very useful to cabinetmakers, and as affording masts to the small vessels used in the East. It is an elegant tree, and is frequently planted in parks as an ornament. The victors in the Isthmian games, in honour of Palemon, were crowned with wreaths made of the pine tree. The species called *P. sylvestris* is perhaps the most valuable of all the pines. It grows in all parts of Europe, in the Caucasus and in Siberia, though it seems to attain its greatest elevation the farther north it extends, or when growing on lofty mountains. It attains a height of 90 or even 100 feet, the trunk being straight, covered with a thick, brown, cracked bark, and terminating in a pyramidal cyme of horizontal branches. Its leaves are in pairs, stiff, glaucous, and short. The cones vary in size, but generally speaking they are small. Several varieties are known, and are even considered by some botanists as distinct species. The variety described as *P. rubra* is the true Scotch fir, or pine, and grows abundantly in Scotland, the climate of which seems particularly suited to it. The timber of this species is the best of all the kinds of pine, and furnishes the red deal of the carpenters. It is used in cabinetmaking, and in naval architecture. That which we derive from Norway and the Baltic is considered the best, and is distinguished by its elasticity, its close texture, at once light and yet resisting, and its durability. Beams of this wood have been taken out of old buildings that have stood for three centuries, quite fresh and sound. The bark possesses a sufficient degree of astringency to make it useful to the natives of the north of Europe for tanning, and as a substitute for oak bark. In times of famine, the Laplanders and Fins make a kind of bread with the triturated internal layers of the bark. The charcoal made from the wood of this pine is considered very good, and the resinous products are of considerable importance. *P. maritima*, the Bordeaux pine, a native of the south of Europe, is nearly of equal height with the last. Its trunk is thicker, but not so straight, and its cyme of branches is pyramidal. The cones are erect and conical, and its leaves are in twos, and longer than those of *P. sylvestris*. It is of rapid growth, and of late years it has been cultivated in some parts of France, especially in the Llandes of Gascony, where it has become of great value in fixing the soil in the neighbourhood of the moving sands of that country. Its timber is inferior to that of the preceding, but its resinous products make it of considerable importance. The Corsican pine, *P. Laricio*, is a native of Corsica, Italy, Austria, and the Crimea. It is a fine handsome tree, frequently attaining the height of 120 or 150 feet, and possessing a trunk nine feet in diameter. It rises straight, and has a grayish cracked bark. Its cones are sessile, solitary, often double, or even in threes or fours, and are twice the size of those of *sylvestris*. It grows more rapidly than that species, but its wood is inferior in quality. The heart is white and durable, and as it has a fine grain, it is much used by carvers. Several American species of pine are also trees of considerable value. *P. australis*, the yellow or long leaved pine, a native of the dry arid parts of Louisiana, Florida, Carolina, and the southern parts of the United States generally, reaches a height of ninety feet, and has a straight trunk, covered with a lamellar bark. Its leaves are in threes, are crowded at the ends of the branches, and are of a fine green. It is a handsome tree, and its wood is very useful to cabinetmakers, carpenters, and for making masts for ships. It produces a great deal of resin. *P. Strobus*, the Weymouth pine, is another fine North American tree, a native of Canada, and is cultivated in European parks for the sake of its beauty. It is one of the most lofty of all the genus, rising to a height of from 150 to 180 feet. Its trunk is remarkably straight, and is terminated by a conical cyme of moderately spreading branches. Its leaves are in fives, and its cones are cylindrical, a little arched and pedunculated. It is a tree of rapid growth, and makes excellent masts for ships. The resinous products of various species of pines, especially *P. sylvestris*, the Scotch fir, are very valuable. Turpentine is a resinous juice which flows from wounds made in the bark of this tree. Those which are most exposed to the sun, and have the thickest barks,

yield it in the greatest abundance, and they begin to produce it when they are forty years old. The greater portion used in this country is imported from the United States. The oil, or spirit of turpentine, is obtained from the substance by distillation. Tar is obtained by burning the roots and billets of wood of the Scotch fir in a close smothering heat. During this combustion the tar exudes, and is collected in a cast iron pan at the bottom of the cavity where the fire is placed. The ancient Greeks made tar in the same manner as is done at the present day. The best is procured from the north of Europe. Pitch is obtained by inspissating tar, or boiling it down to dryness. Large quantities are manufactured in Great Britain.

Pipa.—The genus to which the Surinam toad belongs. See BATRACHIA.

Piper. *Pepper.*—See PIPERACEÆ.

Piperaceæ.—A nat. ord. of dicotyledonous plants, composed of shrubs, or herbs, with articulated stems, and spiked or racemose flowers. They are natives of the hottest parts of the globe, and are common in India and South America. The woody tissue of these plants exhibits a number of fibrous bundles scattered through the medulla like the monocotyledons. They are well known for the hot, acrid, and aromatic properties they possess, which are owing to the existence of an acrid resin, associated with a volatile oil, and a crystalline principle known by the name of *Piperine*. These properties appear to be chiefly concentrated in the fruit. Upwards of 600 species are described. The herbaceous species chiefly belong to the genus *Peperonia*, and amount to more than 190. They are chiefly natives of America, are fleshy succulent plants, and the berries are used by the natives of Peru, &c., as popular remedies for various complaints. The shrubby species are much more numerous, and originally they all belonged to the genus *Piper*, though now that genus is sub-divided into several others. Amongst these are many of great interest, and some of very considerable importance for their economical and medicinal uses, and commercial value. The black and white peppers of commerce, so universally used as warm condiments, are obtained from a species which grows in the East Indies, and more especially on the Malabar coast. This plant, *Piper nigrum*, is cultivated to a great extent in all the warm parts of Asia, and the Eastern islands, in the islands of Bourbon and the Mauritius, and in some parts of America. It is a climbing plant, with coriaceous, glabrous leaves, marked, when young, with translucid spots. The berries are the parts used. The dried unripe fruit constitutes the black, and the ripe fruit, deprived of its outer fleshy covering by washing, forms the white pepper of the shops. Immense quantities of this pepper are imported into Europe, especially from India and the Eastern islands. About 50,000,000 of lbs. are produced in these countries annually, of which, in 1832, 4,630,475 lbs. were imported to Great Britain, 2,225,491 lbs. being retained for home consumption. The long pepper of commerce is obtained from another species, *Chavica officinarum* = *Piper longum*. This species is a shrub, growing in India, the Straits of Sunda, and in the Philippine Islands. The stem is about as thick as a man's thumb, and the leaves are coriaceous and dotted with very fine translucid spots. The dried fruiting spikes are the parts used. They are collected before they become ripe, and are dried in the sun. The Malays and Javanese use long pepper to a great extent as a medicine, and the root is also much esteemed by them as a remedy in various disorders. Another species of this family, *Macropiper methysticum*, grows in the islands of the Pacific, and is called by the natives kava. The root is the part used. This is chewed, the juice mixed with the saliva is collected, and then mixed with the milk of the cocoa nut, or water. In this state it undergoes the process of fermentation, and forms a stimulating drink, which is of a greenish colour, and very hot. This beverage is used daily by the natives, but it is said the long continued use of it, or when taken in excess, produces lamentable effects. It causes very great excitement and irritation in the system; the eyes become red and bloodshot, the skin dries up and exfoliates, and the body soon becomes covered with ulcers. The unhappy being finally becomes totally prostrated, and emaciated to the highest degree. The betle pepper, *Chavica* (*Piper*) *Betle*, so much used in the East, belongs to this family also. Originally it was a native of the Isles of Sunda, but it is now cultivated throughout the hot parts of Asia, and the whole of the Indian archipelago. It is a climbing shrub, and the leaves are the parts used. They are collected when they begin to get yellow, and are packed up in little bundles of twenty, or thirty, and in that state sold to the natives of the East, in every bazaar throughout the country. Mixed with the fruit of the areca nut (see ARECA) and a little lime, or chunam, they constitute the masticatory known as the betel. This is universally used amongst the natives of India, and the consumption is immense, nobody, rich or poor, being without their box of betel, which they present to each other, by way of civility, as we do snuff. Its continued use renders the lips red, and the teeth black, but the natives esteem it as possessing wonderful virtues for strengthening the gums and sweetening the breath. *Chavica* (*Piper*) *Siriboa*, a climbing shrub, growing in the Moluccas, is used in the same manner, and serves as a substitute for the betel. The buds are the parts employed instead of the leaves, and they are stronger and more powerful than the true betel. The well known pepper called cubebs pepper is the produce of another species, *Cubeba officinalis* = *Piper Cubeba*. This is a climbing shrub, growing in the district of Bantam, in Java, and is now cultivated in that part of the

country to a considerable extent for exportation to Europe. The fruit is the part used, and it forms a most excellent medicine in cases of mucous discharges, especially those from the urethra. This property depends upon the presence of a peculiar resin, *cubebine*, mixed with a volatile oil. Cubebs is much employed by European physicians, and in 1830, 18,540 lbs. weight were entered for home consumption in England.

Pipridæ. *The Manakins.*—A sub-family of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Ampelidæ*. They are birds of a small size; their feet lengthened, slender, and weak; the bill very short, and the upper mandible much curved. The genus *Pipra* is the type. There are several species, for the most part natives of the warmer parts of America, and noted for the brilliancy of their colours. They frequent woods, are very active, their flight is short, but very quick, and they utter a sharp piping note.

Pisces. *Fishes.*—An extensive class of the animal kingdom, containing those animals known as fishes. Fishes are vertebrated animals, and like the rest of that group possess a brain and spinal marrow enclosed in a vertebral column. They stand the lowest in the scale of the *Vertebrata*. They have red blood, and respiration is carried on during the whole course of their life by means of branchiæ, or gills. They all live in the water, and are admirably adapted for that kind of life. The head is united to the body without the intervention of a neck, and their body is shaped so as to offer the least amount of resistance, and is nearly of the same specific gravity as the element which they inhabit. It is furnished with fins, or membranes, spread upon and supported by filaments, or rays, of more or less power and flexibility. The two anterior fins correspond with the fore legs, and the two posterior with the hind legs of the higher animals. They are cold blooded animals, their temperature is only a few degrees higher than that of the water in which they live, and their body is covered with scales, and lubricated with a quantity of mucus. The nervous system is simpler than any of the other classes of vertebrated animals. Their sense of touch is more obtuse, their organs of smell and taste less developed, and their apparatus for hearing is quite enclosed within the head, having no external ear, or auditory canal, for collecting and conveying the vibrations by which sound is produced and transmitted. The eye, however, is larger in proportion, in many of them, than in other vertebrals. They have no lachrymal gland, and very few have anything like eyelids, or nictitating membrane. Nutrition is very active, the appetite generally very voracious, digestion rapid, and their growth very quick. Their reproductive power also is exceedingly great. The heart is simple, consisting of a single auricle and ventricle, and the venous blood is propelled through the organs called gills by means of which they breathe, and this blood is oxygenated by the agency of the water on these organs. Fishes were the first of the vertebrals that appeared on earth, and according to the account of palæontologists, at an epoch long antecedent to the deposits in which the remains of the higher animals are found; and what is remarkable is, that these primitive fish were on a par with the more highly organized fishes of the present day.

Piscidia (*piscis*, a fish; *cædo*, to kill).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The species are natives of the West Indies and tropical America, and are trees of considerable size. *P. erythrina*, the dogwood, possesses the peculiar property of intoxicating fish. A preparation of the root is infused in the water containing the fish, which soon rise to the top, and float insensibly on the surface. A tincture of the same part of the plant has been found very successful in relieving the pain of toothache. The juice of the root is used to poison arrows for shooting birds, and is said to be an effectual remedy for the mange in dogs. The timber of this tree is considered to be amongst the best which Jamaica possesses, the wood being almost imperishable.

Pisolite. *Pea Stone.*—A variety of calcareous spar, occurring in small globular masses, like peas. These usually consist of concentric lamellæ, in the midst of which is generally a grain of sand.

Pistacia.—A genus of dicotyledonous plants belonging to the nat. ord. *Anacardiaceæ*. The species are trees, growing in the region of the Mediterranean. One of the best known is the pistachio nut tree, *P. vera*. See ANACARDIACEÆ. *P. Terebinthus* is a tree from thirty to thirty-five feet high, and is a native of southern Europe and the north of Africa. From incisions made in the bark of this tree, there flows a liquid resinous substance, known in commerce as Chian turpentine, esteemed the most valuable of all the turpentines. It receives its name from being collected in the island of Chio, where the tree thrives. This turpentine is high priced, and in consequence is often adulterated. The leaves are often attacked by an insect which produces galls, and these are used in the Levant as a dye for silk. *P. Lentiscus*, a branched, tortuous shrub, ten or twelve feet high, is a native of the coasts and islands of the Mediterranean, and is much cultivated in the island of Chio. From incisions made in the bark of the trunk and large branches of this tree, there exudes a concrete, resinous substance, well known as gum-mastiche, or mastic. Mastic is very much used by the natives of the East, and forms one of the most important articles of commerce with the island of Chio. It has an agreeable aromatic flavour, and the ladies of the East are in the constant habit of chewing it, for the purpose of sweetening their

breath, strengthening their gums, and whitening the teeth. They burn it also in the form of pastiles, for perfuming their houses.

Pistieæ.—The duck-weed family of plants. See ARACEÆ.

Pisum. *The Pea.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*. *P. sativum* furnishes the common pea of our gardens. *P. arvense* yields the gray pea of our fields. *P. maritimum* is the sea pea. It is a native of many parts of Europe; and though the seeds are bitter, they have been used as an article of food. Cattle are fond of the herb. Several other species are known, all producing edible seeds, but the two first are the most valuable.

Pitcairnia (after *Mr. Pitcairn*, a botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Bromeliaceæ*. The species are herbs, growing in tropical America and the West Indies. Some of them are remarkable for the beauty of their flowers, which are large, brilliantly coloured, and united into a terminal bunch. Two species, *P. bracteata* and *P. bromeliæfolia*, are cultivated in Europe, on account of their beauty.

Pithecia. *The Sakis.*—A genus of quadrumanous animals belonging to the family *Cebidæ*. The species are natives of America, and are characterized by their having a thick, hairy tail, which is nearly as long as the body, and being often furnished with a dense beard. Of all the monkeys, they are said most to resemble man. The Capuchin monkey, *P. Chiropotes*, a native of the forests on the banks of the Orinoco, is the most like. Its eyes have an expression of melancholy and fierceness combined, and it has a long, thick beard covering the chin. It is strong, active, and fierce, is tamed with difficulty, and when enraged, raises himself on his hinder extremities, grinds his teeth, and leaps round his antagonist with threatening gestures. Wetting his beard throws him into a great rage, and it is said when he drinks he lifts the water up in the hollow of his hand, and drinks with great deliberation, taking good care not to allow a drop to fall upon his beard. He is two feet nine inches long, tail included, and has large sunken eyes overarched with well marked brows. *P. melanocephala*, the cacajao, is only about one foot long, and resembles very much an old withered negro in miniature. It is a voracious animal, but is mild, easily frightened, and lives in troops.

Pitta.—A genus of birds belonging to the dentirostral tribe, of the order *Passeres*, family *Turdidæ*, and sub-family *Formicarinæ*, or ant-thrushes. The species are lively, pretty birds, and have the gradually curved bill of the true thrushes, but much stronger. They are natives of hot climates, and live chiefly on ants and other insects. They fly but little, and some of them have sonorous voices. *Pitta brachyura* is a native of Ceylon. It is a lively bird, and very common, but more often seen than heard. It is wary and shy in its habits, and frequents tangled brakes and the ill kept native gardens. It preys much upon ants, and resorts to the same hill for days together. It seldom alights on trees, only perhaps when alarmed, but keeps exclusively to the ground or to the lowest branches of the underwood.

Placuna (πλαξ, a broad plate).—A genus of molluscous animals belonging to the class *Conchifera*, and forming the type of a small family, *Placunidæ*. The species are sub-orbicular, compressed, of a white translucent texture. The cartilages are placed on the edge of two diverging ridges on one of the valves, which fit into two grooves in the other. One of the species, *P. sella*, is coloured internally, and is known by the name of the Hungarian saddle. Another is perfectly transparent. This species, *P. placenta*, is a native of the Chinese seas, and is used by the natives instead of glass to glaze windows. Several species, which have, however, been formed into sub-genera, are found fossil.

Planaria (*planus*, flat).—A genus of annelids, the greater number of which inhabit fresh water ponds and ditches. As their name implies, they are remarkable for their flattened form, which resembles at first sight the foot of a gasteropodous mollusc. Many worms used to be arranged under the genus *Planaria*, but now this name is confined to those which have only one orifice to their digestive system, which is placed about the middle of the under surface of the body, a ramified arbusculiform stomach, and an exsertile proboscis. Of late the old genus *Planaria* has been revised, a number of new genera have been proposed, and a distinct order has been established to receive them. This order has been named *Dendrocœla*, of which the restricted genus *Planaria* is the type. The true planarias are aquatic; but a remarkable species, resembling a planaria, was described some years ago as found in the West Indies, living on the decayed fronds of palms, on the summits of high mountains, and respiring free air. This forms the type of the genus *Herpa*, having the aperture of the digestive system placed at the extremity of the body.

Planera (after *M. Planer*, a botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Urticaceæ*, and sub-order *Ulmaceæ*. The species are trees, natives of North America and the countries bordering on the Caspian Sea. *P. aquatica* is a moderate sized tree, growing in the warmer parts of North America, in Carolina, &c. The wood is heavy and hard, and is used for many purposes. *P. crenata* is a native of the Trans-Caucasian provinces of the Caspian Sea. It is a fine lofty tree, reaching the height of seventy-five feet, with a straight trunk, and a broad tufted cyme of erect branches. Its leaves are coriaceous, oval-shaped, and the flowers are small and disagreeably scented. The tree is

known in its native country by the name of "zelkova;" and the wood is of a deep red colour, heavy, tough, and so very hard that it is difficult to drive a nail into it. It is equal to the ash in strength and elasticity. The natives of the countries where it grows prefer it to the oak for making planks for their houses, &c.; and as it possesses an agreeable colour, is fine grained, and takes a good polish, they use it very much in the manufacture of articles of furniture. It resists the destructive action of insects, and withstands well the action of the atmosphere.

Planorbis (*planus*, flat; *orbis*, an orb).—A genus of fresh water *Mollusca* belonging to the class *Gasteropoda*, order *Pulmonifera*, and family *Lymneidæ*. The species are numerous, and distinguished by the shells being flat, discoidal, and many-whirled, all the whirls being visible equally above or below. About sixty recent species have been described, several of which are natives of Great Britain; and an equal number are found fossil.

Plantaginaceæ. *The Rib-wort family.*—A nat. ord. of dicotyledonous plants, of which the genus *Plantago* is the type. The species of this genus are numerous and herbaceous. They are found in almost all parts of the world, but chiefly in temperate and cool regions. The plants are often stemless, their leaves are radical, spread on the ground in a star shape, and a lengthened naked peduncle rises from the centre, having a terminal, cylindrical head of flowers. One of the most common species in this country is the greater plantain, or way-bred, *Plantago major*. This plant had in former days a great reputation amongst medical men as a vulnerary, being assumed to be capable of arresting hæmorrhages and vomitings, and to prove useful in consumption. The leaves at the present day are often used for making poultices and ointments by country herbalists. Small birds are very fond of the seeds, and the spikes are in great demand amongst those who keep cage-birds. The name "way-bred" is derived from the fact of the plant being chiefly found on road sides and pathways. It is said to follow the footsteps of man wherever he goes, being found in all our colonies in every part of the world. The Indians of North America call it "whiteman's foot," from its springing up near every settlement the colonists make. *P. Psyllium*, a native of the south of Europe, is remarkable for the shape and appearance of its seeds. They are flat on one side, of an oblong or ovoid form, of a blackish-brown colour, and about the size and shape of a flea. A decoction of these seeds is used in medicine as an emollient, soothing application, acting in the same way as lintseed. It is more particularly, however, used for gumming and whitening muslins; and considerable quantities are exported from Nismes and Montpellier to the north of Europe for that purpose.

Plantago. *The Plantain.*—See PLANTAGINACEÆ.

Plantigrada (*planta*, sole of the foot; *gradior*, to walk).—An order of carnivorous animals belonging to the class *Mammalia*, used by some zoologists to contain those species of *Feræ* which place the whole of the sole of the foot upon the ground, as the bears, *Ursidæ*, &c.

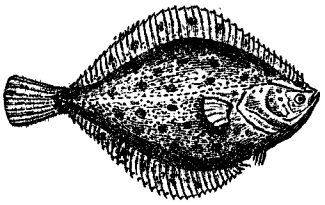
Platalea. *The Spoonbill.*—A genus of birds. See ARDEIDÆ.

Platanista.—A genus of cetaceans. See DELPHINIDÆ.

Platanus (πλατυς, broad).—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, and sub-order *Plataneæ*, of which it is the only genus. The species are trees, often of great size, and found growing in the temperate and sub-tropical countries of both continents in the northern hemisphere. Six species have been described; but some botanists consider them as only varieties, and place them all under one, *P. vulgaris*. The plane tree was well known to the ancients, and has been cultivated from a very early period throughout Greece, Italy, and Asia, but does not appear to have been introduced into Great Britain till the middle of the sixteenth century. Some say that the sycamore of the ancients is the *P. orientalis*, or Oriental plane; and in Scotland, from the resemblance of the leaves of this species to that tree, it is often called the sycamore. The Oriental plane sometimes acquires an enormous thickness, occasionally measuring as much as 80 or even 150 feet in circumference. In height, it seldom rises more than between seventy and eighty feet. The wood, when full grown and dried, weighs forty-nine pounds the cubic foot. In the East it is much used by cabinetmakers in the manufacture of articles of furniture. Its grain is close, and it is susceptible of taking a high polish. The Swiss baskets, and other little fancy articles, so commonly sold in that country, are made of plane tree wood; and it appears to resist well the attacks of insects. Of late it has been asserted that the little stiff hairs which are found in great numbers on the young parts of the tree, become sooner or later detached, and when carried by the wind through the air, enter the lungs of man and many of the lower animals, and produce dangerous consequences. The species found in America is *P. occidentalis*. It is found in most parts of North America, from Mexico to Canada. The timber is of a reddish colour, and will not bear exposure to the weather.

Platessa.—A genus of malacopterygious fishes belonging to the family *Pleuronectidæ*, and containing several well known fishes. The species are of a rhomboidal form, and the greater number have both eyes on the right side. Each jaw is armed with a single row of obtuse teeth, and the pharyngeals have a number arranged like paving stones. They are for the chief part European fishes, and are much used as food. *P.*

communis (*Pleuronectes Platessa*), the plaice, is very common on our coasts, and is usually about a foot or more in length, and sometimes attains



Platessa communis—The Plaice.

the weight of fifteen pounds. *P. flesus* is the well known flounder; and *P. limanda* is known by the name of the dab. This latter species is more commonly seen in the markets in France than any of the others.

Platinum or **Platina** (*platina*, a diminutive of *plata*, the Spanish word for silver).—A metal of a steel-gray colour, resembling that of silver. It was discovered in 1735 in the provinces of Choco and Barbacoas, in Colombia, and first made known in Europe in 1741, by Mr. Wood, assay-master in Jamaica. Native platinum is found in the form of small, irregularly round grains, of a metallic lustre, shining, and opaque. It is malleable, slightly expansible, remains unchanged by exposure to the atmosphere, is infusible in the strongest heat of a smith's forge, and can only be acted upon or dissolved by nitro-muriatic acid. Next to native iridium, which is a metal generally found associated with it, platinum is the heaviest metal known, its density varying from 19 to 21, specific gravity, 17·332; hardness, 4·25. It is very ductile, being capable of being drawn into wires of $\frac{1}{720}$th inch in diameter; and its tenacity is such, that a wire of ·078 inch supports a weight of 274·31 lbs. In addition to the places where it was first discovered, platinum is now found in the province of Minas Geraes in Brazil, in St. Domingo, Siberia, and in the Oural Mountains. In the latter locality it is found in such quantity, that in Russia it is converted into legal money. It is a very useful metal in the arts, being extensively employed for making crucibles, and other apparatus for the use of chemists, for the points of lightning conductors, standard measures, &c., and in the manufacture of porcelain, to give it the appearance of being silvered. Four other metals are generally found in conjunction with platinum, viz., *Iridium*, *Palladium* (see this word), *Osmium*, and *Rhodium*. Iridium and rhodium are very hard, and are used as nibs for gold pens.

Platonia.—A genus of plants. See CLUSIACEÆ.

Platurus (πλατυς, broad; ουρα, tail).—A genus of serpents. See COLUBRIDÆ.

Platycarcinus (πλατυς, broad; καρκινος, crab).—A genus of *Crustacea*. See CANCER.

Platycercus (πλατυς, broad; κερκος, tail).—A genus of parrots. See PSITTACIDÆ.

Platycrinus.—A genus of fossil echinoderms. See CRINOIDEA.

Platydactylus (πλατυς, broad; δακτυλος, joint).—A genus of saurian reptiles. See GECKOTIDÆ.

Platypus (πλατυς, broad; πους, foot). *The Duck-bill.*—A synonym of ORNITHORHYNCHUS.

Platyrhynchus (πλατυς, broad; ρυγχος, beak).—A genus of *Mammalia* belonging to the order *Feræ*, and family *Phocidæ*, and containing the sea-lion, *P. leoninus*. See PHOCIDÆ.

Also a genus of birds belonging to the order *Passeres*, and family *Muscicapidæ*. The species are intertropical birds, and their song is agreeable. They live on insects, which they seize on the wing. *P. cancromus* is the type.

Plectognathi (πλεκτος, interlaced; γναθος, jaw).—An order of fishes containing those species which have the jaws formed of the maxillary and intermaxillary bones united together into one body, and the palatine arch connected to the cranium by a suture, and, in consequence, immovable. Their skeleton is soft but fibrous, the bones being only partially ossified. The opercula and the rays are concealed under a thick skin, so that only a small branchial opening is visible externally. The skin is covered with ganoid scales or spines, they have no pancreatic cœca, their ribs are reduced to mere vestiges, and their ventral fins are not distinctly developed. This order contains the diodons and moon-fish, DIODONTIDÆ; the file-fishes, BALISTIDÆ; and the trunk-fishes, OSTRACIONIDÆ.

Plectrophanes. *The Snow Bunting.*—See EMBERIZINÆ.

Plesiosaurus (πλησιος, like to; σαυρος, lizard).—A genus of fossil saurian reptiles. See ENALIOSAURI.

Pleuronectes.—See PLEURONECTIDÆ.

Pleuronectidæ (πλευρα, side; νηκτης, swimmer).—A family of fishes belonging to the order *Anacanthini*, or those which have no spines or pungent rays in the fins, and containing many well known species. They are generally known by the name of flat-fish, and are peculiar amongst all vertebrated animals in having both eyes placed on one side of the head, which side is always uppermost when the fish swims, and is strongly coloured, while the under side is white. The body is very much compressed, fringed above by a long dorsal fin which extends all the length of the back. They are destitute of swimming bladder. The species belonging to this family are of great importance to our maritime population, and give employment to large bodies of fishermen on various parts of our coast. They abound in comparatively shallow water, where the bottom is sandy, though some of the largest, as the turbot and halibut, are taken farther out at sea. The genus *Pleuronectes* formerly contained the whole family, but of late it has been

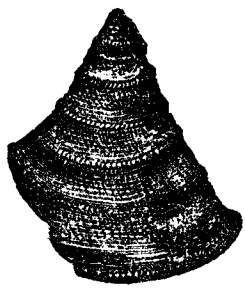
subdivided into many sub-genera. The sole, so well known as one of our best and most delicate fishes for the table, is the type of the genus *Solea*. These fishes are distinguished by their more elongated form, and the blunt and rounded shape of the muzzle. The eyes are on the right side. *Solea vulgaris*, the common sole, is taken in immense quantities on the British coasts. Eighty-six thousand bushels have been received at Billingsgate market in one year. The turbots belong to the genus *Rhombus*. In this genus the eyes are on the left side. *R. maximus*, the common turbot, is the most esteemed of all the family. It is called the water or sea pheasant by the common people in France, on account of its fine flavour. The upper surface of the body is brown, and beset with hard tubercles, which distinguishes it from the brill, *R. vulgaris*. This is a smaller fish than the turbot, and not so delicate in flavour. Both these fishes are common on the coasts of Great Britain, but a large portion of the turbot produced in the English market is taken on or near the various sand-banks between the long line of our eastern shore and the coast of Holland. The number brought to the London market alone, amount in each season, on an average, to 88,000; and a sum of £15,000 a-year is paid to the Danes for lobsters to make sauce for them. The holibut or halibut, forms part of the genus *Hippoglossus*, and is the largest of the family. See HIPPOGLOSSUS. The plaice and flounder belong to the genus PLATESSA —which see.

Pleuroptera (πλευρα, side; πτερον, wing). *The Flying Lemur.*—A synonym of GALEOPITHECUS.

Pleurosaurus (πλευρα, side; σαυρος, lizard). —A genus of fossil reptiles, a peculiarity of which is that the vertebræ of the tail are larger than those of the back.

Pleurotoma (πλευρα, side; τομη, slit).—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of the family *Pleurotomidæ*. The species are numerous, about 430 having been described, and instead of being all contained in this one genus, are now arranged in several genera, differing from each other chiefly in the form of the operculum and the length of the canal. They are characterized by a more or less deeply cut slit in the side of the outer lip. The animal has a long cylindrical syphon which is lodged in the canal of the shell, which in general is long and straight. They are carnivorous animals, and the greater number are natives of warm climates, though several are found in the northern seas, Great Britain, and the Mediterranean. About 300 species occur fossil, chiefly in the chalk.

Pleurotomaria.—A genus of fossil shells belonging to the class *Gasteropoda*, and family *Haliotidæ*. Numerous species, about 400, have been found in the lower silurian and chalk. They are trochiform, solid, few-whirled, with an enlarged spire, an oblong four-sided mouth, and a deep slit in its outer margin, hence its name. Some species rival the living *Turbines* in magnitude and solidity, whilst others are as frail as *Janthina*.



Pleurotomaria conoidea,

Plexaura (mythological name).—A genus of zoophytes belonging to the order *Asteroida*, and family *Gorgoniidæ*. The species contained in this genus have the horny axis covered with a thick, corky, almost earthy-looking crust, studded with large unequal cells. The species are natives of the Mediterranean and American seas.

Pliosaurus (πλειος, complete; σαυρος, lizard). —A genus of fossil saurian reptiles. See ENALIOSAURI.

Plocamium (πλοκαμος, a tress of hair).—A genus of acotyledonous plants belonging to the nat. ord. *Algæ*, sub-order *Fuci*, and tribe *Delesseriæ*. The only European species of this genus, *P. coccineum*, is one of the most beautiful seaweeds we have.

Ploceinæ. *The Weavers.*—A sub-family of birds belonging to the conirostral tribe of the order *Passeres*, and family *Fringillidæ*. They have large conical bills and pointed wings. They are natives of hot climates, being found in Africa, India, &c. Their food consists chiefly of seeds, but some seek for parasitical insects off the hides of the wild buffalo of South Africa. They receive the name of "weavers" from the surprising skill with which they fabricate their nests. Some of these, made of green grass curiously woven, are shaped exactly like a chemist's retort, and suspended from a branch of a tree extending over a river or pool of water. They are suspended from the head, and the narrow part or neck, eight or nine inches long, with the aperture at the bottom, almost touches the water. Others are built in a clump of many together on a tree, all placed under one roof or cover, and each nest having a separate entrance on the under side. They are constructed of grass, and trees may be seen with the boughs completely covered over, the aerial city, as it may be called, sometimes occupying a space of ten feet in diameter, and comprising a population of some hundreds. The birds which construct these nests, *Philetaerus* (*Loxia*) *socius*,

never, it is said, use the same a second time, but in the following season construct fresh ones upon the lower surface of those of the preceding year. In this manner they proceed year after year, adding to the mass, till at last the weight often becomes such as to cause the destruction of the tree upon which it is built. Others again, as the nests of *Ploceus capensis*, constructed of the same materials, are kidney-shaped, with the entrance at the upper end and directed downwards. Five or six of these nests are suspended from a branch of a tree, overhanging a pool of water, and the twigs which approach nearest the water are generally preferred. This sub-family contains a number of genera, of which the genus *Ploceus* may be taken as the type. A species of this genus which is very common in India during the grain season, is occasionally taught tricks by the natives, such as loading and firing a small cannon. An extraordinary arrangement has been witnessed in the nest of this bird. On one side of the interior a piece of clay is fixed, and into this the bird, during the season of incubation, places a glow-worm or fire-fly during the night! The whidah-finches or widow-birds, *Vidua*, belong to the *Ploceinæ*. *V. paradisea*, a native of Senegal and South Africa, is a favourite cage bird in this country. It is about the size of a canary, and the male is remarkable for two very long drooping tail feathers, measuring a foot in length, and two others shorter, but with very broad webs. The prevailing colours of the species of *Vidua* are sombre, and this perhaps has given them their name. The genus *Textor* contains a species, *T. erythrorhynchus*, which is a native of South Africa, and is remarkable for its habits. It is always found in company with the buffalo, and besides ridding its huge associate of many of the insects with which its skin is infested, acts as a sentinel to warn it of any impending danger. On observing any unusual appearance in the neighbourhood, the little bird flies up suddenly and thus calls the attention of the buffaloes, who once alarmed, soon take to flight accompanied with their vigilant attendant.

Ploesconia.—A genus of ciliated *Infusoria*, natives of both fresh and salt water. They are of a discoidal form, and are covered with a cuirass marked with longitudinal ribs. One of the sides is furnished with numerous thick cilia, which appear to serve the animal as organs of motion, while the other side is furnished with a row of vibratile cilia arranged in a semicircular shape, the action of which is to cause a whirlpool in the water, and draw objects of food within reach of its mouth.

Plotosus.—A genus of malacopterygious fishes belonging to the division *Abdominales*, and family *Siluridæ*. Their body is long, terminating in a compressed point, and the dorsal and pectoral fins are provided with sharp pointed dentated spines. The species are natives of the seas of Asia. *P. lineatus* may be taken as the type; a fish about a foot long, with a large depressed obtuse head, and the upper jaw longer than the lower. It is of a greenish-brown colour above, white underneath, and has three coloured lines which traverse the whole length of the body. This fish lives in the mud at the bottom of the sea, and is much dreaded by the fishermen on account of the small, sharp cutting spines of the fins, with which, when handled incautiously, the fish can inflict severe wounds. It is said, indeed, that sometimes fatal consequences are produced by these injuries, and the Arabs dread this fish more than they do the scorpion.

Plotus. *The Darter.*—A genus of birds belonging to the order *Anseres*, family *Pelecanidæ*, and forming the type of the small sub-family *Plotinæ*. The bill in the species of this genus is longer than the head, quite straight, firm though slender, and terminating in a very sharp point. The feet are short and robust, the wings short, and the tail long. The neck of the darters is long, tortuous, and snake-like, and they have been described as "reptiles grafted on the body of a bird." Though the water is their favourite element, they build their nest upon trees or rocks. One of the species, *P. Levaillantii*, is a native of South Africa, and is called by the Hottentots, "the bird with a serpent's neck." Another species, *P. Anhinga* or *Americanus*, is a native of Florida, Carolina, Georgia, and Brazil. The people call them "snake birds." The anhingas live upon fish, and their movements are rapid and graceful. They fly high during the heat of the day.

Plumbaginaceæ. *The Sea Pink family.*—A nat. ord. of dicotyledonous plants, consisting of herbs or under-shrubs with alternate or fasciculate leaves without stipulæ, and flowers capitate or panicled. The species inhabit the sea shores and salt marshes chiefly in temperate regions. They are divided into two sub-families:—1. *Staticeæ*, containing the plants well known as thrift, sea pinks, &c., and of which the genus STATICE is the type. 2. *Plumbagineæ*, typified by the genus *Plumbago*. Several species of this genus are known. One of these, *P. Europæa*, is a native of Europe, and is known in the south of France by the name of "malherbe." The root is irritant, and has been used as a rubefacient and vesicant. Chewed it often relieves toothache, and has hence been called "toothwort." *P. scandens*, a native of South America and the West Indies, possesses the same properties, and is often called "herbe au diable." It is a small climbing shrub.

Plumbago.—A genus of plants. See PLUMBAGINACEÆ—also the name given to black lead. See GRAPHITE.

Plumbum. *Lead.*—A metal. See LEAD.

Pluvianus.—A genus of birds belonging to the order *Grallæ*, family *Charadriidæ*, and sub-

family *Cursorinæ*. There is only species known, *P. Ægyptius*, a native of Senegal and Egypt. It appears on the banks of the Nile when the waters retire, lives in pairs, and is seldom seen in larger flocks than seven or eight individuals.

Pneumodermon.— A genus of molluscous animals belonging to the class *Pteropoda*. See CLIONIDÆ.

Pneumonobranchiata.—A synonym of PULMONIFERA.

Poa. *The Meadow Grass.*—A genus of monocotyledonous plants belonging to the sub-class *Glumaceæ*, and nat. ord. *Gramineæ*. The species of which this genus is composed form the great bulk of what are called "natural grasses." They are the commonest weeds that follow the migrations of man, and generally contain a sufficient quantity of nutritious matter to render them fodder for various animals. *P. annua* is in some places called the causeway-grass, from its frequency in unfrequented streets. *P. pratensis* and *P. trivialis* are grasses which contribute very greatly to form our meadow pastures.

Pocillopora (*pocillum*, a little cup).—A genus of corals; sub-kingdom *Radiata*, class *Anthozoa*, order *Sclerenchymatosa*, family *Milleporidæ*, and forming the type of the sub-family *Pocilloporinæ*. The species are stony corals, plant-like, branched or lobed, with the surface studded on all sides with small cells sunk in the substance, and having porous interstices. These cells are scattered, distinct, hollowed out into little pits. The species are mostly natives of the Indian seas, typefied by *P. damicornis*, though one is British.

Podargus.—A genus of goat-suckers. See CAPRIMULGIDÆ.

Podiceps.—A genus of web-footed birds. See COLYMBIDÆ.

Podocarpus (πους, a foot; καρπος, fruit.—A genus of dicotyledonous plants belonging to the nat. ord. *Coniferæ*, and composed of trees, often of great size, indigenous to the great chains of mountains in South America, and occurring also at the Cape of Good Hope and New Zealand. The leaves are lanceolate, entire, persisting and scattered. The fruit is in form of a drupe, and the seeds concealed under the fleshy envelope, have a hard shell and an embryo with two short cotyledons. *P. elongatus*, a native of the Cape of Good Hope, may be considered the typical species, and is occasionally cultivated in Europe. *P. dacrydioides*, a New Zealand species, is a gigantic tree rising to the height of near 200 feet, with a stem naked for a great part of its height, and terminated by a magnificent pyramid of branches. The natives call it "Kai-Kaea." *P. zamiæfolius*, a native of the same country, is nearly as high as the last. The wood is hard and resisting, and is very useful in the construction of ships, &c. The New Zealanders construct their canoes of *P. totarra*, the wood being hard and very incorruptible. The fruits of *P. neriifolius* are eatable.

Podopthalma (πους, foot; οφθαλμος, eye). *The Stalk-eyed Crustacea.*—A legion or division of *Crustacea* belonging to the order *Malacostraca*. The most distinguishing characters of the animals belonging to this great division are the possession of organs exclusively formed for the purpose of respiration (branchiæ), and the existence of eyes placed at the extremity of a moveable peduncle or foot-stalk; hence their name. A large portion of the front of the body is covered by a buckler-shaped shell or carapace which extends more or less beyond the thorax; and this species of covering generally tends to distinguish the animals of this division of crustacea at first sight. The *Podopthalma* are divided into two orders, the DECAPODA and the STOMAPODA.

Podura (πους, foot; ουρα, tail). *The Spring-tails.*—A genus of apterous insects belonging to the order *Thysanura*, and forming the type of the family *Poduridæ*. The chief characteristic of the insects of this genus consists in the abdomen, which is distinct from the thorax, ending in a forked caudal appendage which is folded under it when the animal is at rest. This appendage or tail is elastic, and by suddenly extending it, the insect is enabled to spring and leap about in all directions—hence their name of "spring-tails." They are of a leaden colour, and are usually found in damp, shady places, as under stones, in the crevices of the bark of trees, &c. Their food consists of decaying animal and vegetable matters. The body of these insects is covered with scales, which are used as test objects for the microscope.

Poecilopoda (ποικιλος, various; πους, foot). —A division of the entomostracous crustacea, synonymous with the *Cormostomata* of Dana. The animals belonging to the poecilopoda are characterized by the organs of the mouth being adapted for suction and not mastication. They live a parasitic life upon aquatic animals, such as fishes, &c.; and their mouth is therefore constructed so as to accommodate them to their habitations and manner of life. Their body is for the greater part enclosed within a buckler-shaped shell or carapace of a horny substance, and their feet, which are in the greater number four pairs, are partly adapted for enabling them to walk with and partly serve for the purpose of respiration, having branchiæ or gills attached to them. When young, they are free and unattached, and do not resemble in the least their parents, but come very near to the young of the cyclopidæ. As they advance in life, they undergo a series of changes, and become attached to various other animals. Many of them become at last so transformed, that they lose their eyes and feet, and can no longer move from the position they have chosen. Others retain to a considerable extent their powers of locomotion, and

some are able to change their position from one animal to another at will. The genera ARGULUS and CALIGUS are representatives of this division. See these words.

Poephagus. — A genus of oxen to which the yak of India belongs. See BOVIDÆ.

Pogonias (*πωγωνιας*, bearded).—A genus of acanthopterygious fishes belonging to the family *Scicenidæ*, distinguished by the presence of numerous barbels placed in a row under the lower jaw. There are only two species known,—one a native of the China seas, and the other an American fish. They are known by the name of "drums" or "grunts," from the extraordinary noise they make in the water. They grow to a great size, some of them weighing occasionally above a hundred pounds. *P. chromis*, the American species, is so abundant in winter and spring, that the crews of vessels at anchor off the coast of Georgia and Florida, where they are chiefly met with, are utterly deprived of sleep for some nights in succession, till they get accustomed to the noise, by these fishes collecting under the ships' bottoms and producing their peculiar drumming noise, which at the same time is accompanied by a tremulous motion of the whole vessel. Sir John Richardson found that most of the specimens which he had an opportunity of examining had the tails much infested with the parasitic threadworms, *Filariæ;* and he supposed that the peculiar drumming noise which distinguishes them was caused by the uneasiness produced by these parasites; the fish beating their tails against the bottom of the ships in order to get rid of them. The sounds uttered by the Eastern species have been described as a combination of the bass of an organ, the sound of bells, and the guttural cries of a large frog, with certain tones which the imagination might attribute to a gigantic harp.

Poinciana. — A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, suborder *Papilionaceæ*, and named after *M. Poinci*, governor of the French West Indian Islands in the seventeenth century. It is composed of shrubs or small trees, often armed with sharp thorns, and remarkable for the beauty of their flowers. They are natives of Asia and tropical America; their leaves are pinnate, and their flowers in terminal branches. The best known species of the genus is *P. pulcherrima*, the Barbadoes flower-fence, a magnificent shrub, nine to twelve feet high, with fine sweet-scented flowers of a reddish-orange colour bordered with yellow, and united into brilliant-looking clusters hanging from a long peduncle. It is originally a native of India, but has been transported to a variety of other tropical climates. It is armed with strong spines, and is made use of for forming hedges, which are said, though not very useful, to be unrivalled for their beauty. In the West Indies, where this plant is cultivated, the leaves have been used as a substitute for senna. The trunk is generally hollow, and is found to be occupied by a large red or dark brown ant which bites severely.

Poinsettia. — A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*, and named after a botanist, *M. Poinsette*. It contains only one species, *P. (Euphorbia) pulcherrima*, a native of Mexico. It is a very handsome shrub, with a straight branching stem, the branches long and slender. The leaves are large, oval, elliptical, and sinuated, the flowers at the end of the branches, and surrounded with a number of large bracteæ which resemble the leaves, only being narrower, and are of a brilliant red colour, producing a very pretty effect.

Polemoniaceæ. *The Phlox family.*—A nat. ord. of dicotyledonous plants composed of herbs, rarely shrubs, sometimes climbing, and growing in the extratropical parts of America, especially on the north-western coast, but occurring also in Europe and Asia. Their leaves are opposite or alternate, simple or compound, and the flowers are usually terminal and arranged on panicled corymbs. There are seventeen genera in this family, many cultivated in our gardens for their showy flowers. Such are the *Phlox*, *Gilia*, and *Polemonium*, and the rapid climbing *Cobœa*. The genus *Polemonium* may be taken as the type. The species are herbaceous, and are found in Europe, Central Asia, and North America. *P. cæruleum*, or Jacob's ladder, is the best known species. It is indigenous to the fertile, moist parts of Europe and Central Asia, and is very common in the mountains of Asiatic Russia, extending over to the Himalayas. The flowers are violet, blue, or white. It is very rare in England, growing wild, but is much cultivated in our gardens.

Polianthes (*πολυς*, many; *ανθος*, flower).—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*. The tuberose, *P. tuberosa*, is a well known species, and highly prized for the delicious fragrance of its flowers. The native country of this plant, which is very much cultivated in the warmer parts of both the Old and New World, is somewhat doubtful. It is believed, however, by many botanists to be a native of South America, and of late years a species, *P. gracilis*, has been found in South Brazil, which is probably the origin of the garden plant.

Polishing Slate.—A mineral substance of a slaty texture, of a yellowish-white or gray colour, and composed of silica, alumina, oxide of iron, lime, and water. It absorbs water and adheres slightly to the tongue. The silica, which it contains, and which is seventy-nine parts in a hundred, is composed almost entirely of diatomaceæ. Of these microscopic objects it is calculated that 23,000,000 exist in a cubic line, and a grain contains about 187,000,000. The specific gravity of polishing slate is ·6 to ·8, hardness 1·5. It is found near coal at Bilin in Bohemia; Planitz in Saxony; Hesse Cassel, and Auvergne.

Pollen.—The minute powdery matter which we see in the anthers of flowers, and which is the fertilizing agent of the ovules of plants, is called pollen. It consists of small cells developed in the interior of other cells, and when examined by the microscope appears in the form of granules. These granules vary in size from $\frac{1}{500}$th to $\frac{1}{700}$th of an inch in diameter, and their form is much diversified, though generally it is ellipsoidal.

Pollicipes.—A genus of barnacles. See LEPADIDÆ.

Pollyxenidæ.—A family of myriapods. See CHILOGNATHA.

Polyborinæ (πολυς, many kinds; βορα, food). The *Caracaras* or *Naked-Cheeked Eagles.*—A sub-family of birds belonging to the order *Accipitres* or birds of prey, and family *Falconidæ*. The birds of this family are characterized by having the bill hooked at the tip only, the wings long, especially from the third to the sixth quill, and the orbits, cheeks, and part of the throat more or less denuded of feathers. They are of considerable size, are peculiar to South America, and, like the vultures, they generally congregate in flocks to feed on dead animal substances, and after they have taken their food the craw becomes very prominent and naked. The genus *Polyborus* may be taken as the type of the family, and the Brazilian caracara eagle, *P. Brasiliensis*, is the species best known. This bird is about twenty-one inches in length, and in alar extent it measures fifty. The name "caracara" is derived from its hoarse and peculiar cry. These birds are very different from the true falcons in their food. These latter will only eat live prey, while the former seem to be satisfied with anything that comes in their way—hence the name "polyborus." Small birds, toads, frogs, lizards, worms, insects, grubs, all suit the caracara's appetite, and carrion is so gratifying to its taste that it has often been observed to give chase to a vulture and force him to disgorge the piece of dead flesh he had just devoured. It is not a shy bird, but advances to inhabited places, perching on trees and house-tops, and not caring to conceal itself. It seldom if ever attacks poultry, and is therefore not molested by man. Brazil is its chief habitat, but it has a wide range, for it is a constant attendant upon man, and accordingly is found spread over the whole continent of South America from the most southern latitudes to the equator, and from the level of the sea to the tops of the highest Andes. The female builds her nest on the tops of trees, especially on those where the foliage is close or round which climbing plants grow luxuriantly. *Ibycter Americanus*, another species of this family, is said to live partly on vegetable matter, and its manners are described as so mild and gentle that some naturalists have been induced to place it amongst the gallinaceous birds instead of birds of prey.

Polyborus.—See POLYBORINÆ.

Polyergus. *The Amazon Ant.*—A genus of ants. See FORMICIDÆ.

Polygala (πολυς, plenty; γαλα, milk). *Milkwort.*—See POLYGALACEÆ.

Polygalaceæ.—A nat. ord. of dicotyledonous plants, having the appearance in their flowers of belonging to the *Papilionaceæ*. They are shrubs or herbs, are very numerous, nearly 500 being known, and are found in all quarters of the globe. In general they possess a bitter principle, and the roots yield a milky juice. Some of them have been employed as tonics, while others, possessing emetic qualities, have been used as a substitute for ipecacuanha. The genus *Polygala* is the type, containing a considerable number of species, found in various parts of the world, two being British. One of the most common, and which grows abundantly on our heaths, dry pastures, and grassy banks, is the common milk-wort, *P. vulgaris*. It is a pretty little decumbent plant, with blue, white, and pink blossoms. *P. amara*, another European species, growing in moist meadows, is remarkable, as its name imports, for a bitter principle contained in its roots. It acts as a tonic and purgative, and is also used occasionally as a sudorific. *P. senega*, seneka or snake-root, is a native of North America, growing in Virginia, Pennsylvania, &c. The roots have acquired a great reputation in the United States as a cure for the bites of poisonous serpents, such as the rattlesnake, &c. The Indians have great faith in the remedy, and in their migratory excursions carry it in the form of powder along with them. European physicians attach little importance to it in such cases. It has been also strongly recommended in cases of affections of the lungs, and its value in catarrhal complaints where the bronchi are encumbered with mucus, bears a higher reputation than as a cure for serpent bites. Rhatany root is derived from a species of this family. See KRAMERIA.

Polygastrica (πολυς, many; γαστηρ, stomach).—The species belonging to the *Infusoria* have of late been very much reduced in number, but according to Ehrenberg's arrangement of that class, they were all placed in two large divisions, the *Polygastrica* and *Rotatoria*. These latter have been removed entirely to a distinct class by themselves, and the former, or *Polygastrica*, according to the latest systems, include all the animals now left amongst the *Infusoria*.

Polygnathæi (πολυς, many; γναθος, jaw).—A family of double parasitic monsters, characterized by the very incomplete and more or less ill-formed state of the parasite, which appears reduced to merely the jaws, and the rudiments of the other parts of the head. In fact the cases represent a subject, normal in all its parts except the jaws and some other portions of the head, which are found double. In some cases this parasitic head is attached to the palate of the normal individual, and in others to the lower jaw.

Polygonaceæ.—*The Buck-wheat family.*—A nat. ord. of apetalous dicotyledonous plants, composed of herbs or shrubs of considerable size, some of them climbing plants, and found scattered all over the globe, but especially in the temperate regions of the Old World. Many species are of aquatic habits, and their stems and branches are knotted. The seeds of some, as the buck-wheat, are used as an article of food for both man and beasts—see FAGOPYRUM; while the leaves and young shoots of others, as some of the species of *Rumex*, and *Rheum* or rhubarb, are used as salads for tarts, &c. Some abound in various kinds of acids, as oxalic, citric, and malic acids, which give them an agreeable cooling quality, while a combination in others of a resinous, gummy, or astringent property cause them to act as purgatives and tonics, like the rhubarb root. This family contains a number of genera, as *Oxyria*, RHEUM, RUMEX (see these words), and *Polygonum*. This last genus, *Polygonum*, is the type of the family, and is extensive, containing a number of species known by the names of knot-grass, bistort, Persicaria, &c. The snake-weed or bistort, *P. bistorta*, is a powerful astringent. The root is the part used. It contains tannin, gallic acid, and starch; and a decoction of it is employed in chronic mucous discharges as an injection, as a gargle in sore throats, and as a lotion to ulcers attended with excessive discharge. Internally it has been used combined with gentian in intermittents. *P. amphibium* is a native of Great Britain, is very abundant, and, as its name implies, grows either on land in moist situations or in ponds and ditches of water. Linnæus's short description is very apt—"Stupenda metamorphosis plantæ ex solo: in siccis erecta, scabra, tristis; in aquosis natans, glabra, et læta." The long roots which rise from the subaquatic stems bear some resemblance to sarsaparilla, and in France are used as a substitute for that plant. The water pepper, *P. hydropiper*, is another common British species. It is a hot and acrid plant, is reputed to be a powerful diuretic, and its leaves act as vesicants. The seeds are said to be used in some of the French provinces instead of pepper. The plant dyes wool of a yellow colour. The knot-grass, *P. aviculare*, is another very abundant species in this country, growing on road sides, waste places, and cultivated fields. The seeds are reported to be both emetic and purgative; but small birds find a never-failing supply of food in them, and pigs, sheep, and cattle eat the plant with avidity. It is a native of Japan as well as Europe, and the Japanese prepare a blue dye from it.

Polynemus.—A genus of acanthopterygious fishes forming part of and giving its name to a small family called *Polynemidæ*, distinguished from the *Percidæ*, to which it originally belonged, by having the ventral fins abdominal instead of thoracic. The species of the genus *Polynemus* have an oblong form, and the head covered entirely with deciduous scales. They have two dorsal fins widely separated, and the pectorals are furnished with a certain number (varying in the species) of long and feeler-like rays, which in one species bear a resemblance to the tail feathers of a bird of paradise. This species is known by the name of paradise fish. The species of this genus are also remarkable for the great varieties in the form of the air bladder. In a species found in India, *P. Indicus*, the air bladder is large, and has from twenty-eight to thirty-five pointed processes fringing its lateral surface. It has also a very great number of pancreatic cœca divided into two bundles. The fish weighs generally from four to six pounds, but sometimes specimens are taken weighing as much as twenty pounds. The air vessel of a good sized specimen, when dried, weighs upwards of two ounces, and forms an excellent isinglass which fetches in the market at Penang from twenty-five to thirty Spanish dollars the pecul (= 133⅓lbs). They are known there by the name of "fish maws," and in 1842 between 12,000 and 13,000 dollars worth were exported from that island (Penang). Another Indian species, *P. Risua*, is well known to the Anglo-Indians by the name of the mango-fish. It is a native of the Bay of Bengal and the estuaries of the Ganges, and in the breeding season ascends the Hooghly above Calcutta. At that season, April and May, it is considered in its highest perfection, and is sought after as a great delicacy. Few breakfast tables in Calcutta are found during these months without the mango-fish. Several others besides the mango-fish are much esteemed for their excellent flavour.

Polyommatus.—A genus of diurnal *Lepidoptera* belonging to the family *Lycænidæ* or *Polyommatidæ*. The butterflies belonging to this genus are distinguished by having numerous eye-like marks on the under side of their wings. They are small and weak, but beautiful insects of for the most part a fine silvery-blue colour, and are known to collectors by the name of the blues. The caterpillars have a great resemblance to wood lice. A number of species occur in Great Britain.

Polyosma (πολυς, much; οσμη, smell).—A genus of plants. See GROSSULARIACRÆ.

Polyphemus.—A genus of *Entomostraca*. See CLADOCERA.

Polypi (πολυς, many; πους, foot).—**Polypiaria**, or **Polypifera** (*polypi*, polyps; *fero*, to carry).—A name applied by many naturalists to an order of radiated animals, more generally known by the name of *Zoophyta* or zoophytes. See ZOOPHYTA.

Polypidom.—A name applied to the stems or permanent fabries of zoophytes, upon which are placed the little cup-like cells containing the polyps or animals which construct the mass. In many the polypidom is horny and flexible, and more or less divided, with the ramifications disposed in a variety of elegant plant-like forms.

In others it is stony or calcareous, and in a third set it is membrano-calcareous.

Polypodiaceæ.—A sub-order of acotyledonous plants belonging to the great order *Filices*. The species contained in this sub-order of ferns constitute the highest form of cryptogamic vegetation. They are usually herbaceous plants with a permanent stem which remains buried and rooting beneath the soil, or creeps over the stems of trees, or forms a scarcely moveable point of growth, round which new leaves are annually produced in a circle; or it rises into the air in the form of a simple stem, bearing a tuft of leaves at its apex, and sometimes, as in the tree ferns, attaining the height of fifty or sixty feet, and presenting a majestic and graceful appearance. The tree ferns are the most remarkable species belonging to the family—see CYATHEA; but the genus *Polypodium* is the type. This genus is characterized by having the theceæ or fructification on the back of the frond, and by their opening transversely. Several species occur in England.

Polyporus. — A genus of acotyledonous plants belonging to the nat. ord. *Fungi*, and containing the plant which produces the dry rot.

Polyprectron.—A genus of peacocks. See PAVONINÆ.

Polypteridæ.— } A family and genus of
Polypterus.— } fishes. See LEPIDOSTEUS.

Polyzoa (πολυς, many; ζωα, animals).—The extensive class of radiated animals called zoophytes are divided by many naturalists into two large groups. I. The *Anthozoa*, which contain the true zoophytes, or the radiated division; and, II., the *Polyzoa*, or *Bryozoa*, containing those which are molluscan in their organization, and are called molluscan, or ascidian zoophytes. This latter division, the *Polyzoa*, is now removed entirely from the sub-kingdom *Radiata*, and, in accordance with recent observations, is placed in the sub-kingdom *Mollusca*. In some respects the species are closely allied to those of the class *Tunicata*, more especially to the family *Botryllidæ*, or compound ascidians, and in others they approach the *Terebratulæ* among the *Brachiopoda*. The polyzoa are compound animals, and the growth formed by the associated animals, or colony, is termed "polyzoary," corresponding with the "polypidom" of the *Anthozoa*. This is formed of a number of little chambers, or cells, organically united, each of which contains a polypide. They possess organs of digestion, respiration, and circulation, have a muscular and nervous system, and in an embryonic state, are furnished with organs of motion. Their reproduction is effected in three different modes; by gemmation, by ova, and by what have been called free locomotive embryos. The numerous species of animals belonging to the class *Polyzoa* have been arranged in two orders, according to the disposition of the tentacles which surround the mouth. I. *Infundibulata*, or those which have the tentacles disposed in a ring surrounding the unarmed mouth—natives of the sea; and, II., *Hippocrepia*, or those in which the tentacles are disposed in a crescent, or horse-shoe shape—natives of fresh water. The first order is by far the most extensive in number. In some, forming the sub-order *Cheilostomata*, or *Celleporinæ*, the polyzoary is calcareous, or membrano-calcareous, with the cells oblong, or oviform, and having their sub-terminal apertures closed, when the animal retreats, by a membranous fold, or operculum; in others it is calcareous, with the cells tubular, and having their round terminal aperture uncovered, forming the sub-order *Cyclostomata*, or *Tubuliporinæ*; in a third set, the polyzoary is sponge-like, fleshy, and polymorphous, the cells immersed, with a contractile aperture, which, when the polypide is exserted, is surrounded with a fringe of setæ: these form the sub-order *Ctenostomata*, containing the *Halcyonellea*, or *Alcyoniidæ*. In a fourth set, the polyzoary is confervoid, horny, and fistular, and the cells are free. This group contains the *Vesicularinæ*. The second order, *Hippocrepia*, contains comparatively few species, and these are all natives of fresh water. One genus is remarkable from the species belonging to it possessing, when adult, a locomotive faculty. This genus, *Cristatella*, contains only one British species, which is found floating on the surface, and though it possesses motion, its progression is very slow, seldom exceeding an inch in twelve or twenty-four hours.

Pomaceæ.—A nat. ord. of dicotyledonous plants, distinguished by the nature of their fruit. By many botanists it only constitutes a sub-order of the nat. ord. *Rosaceæ*. The genus *Pyrus* may be taken as the type of the family, and is one of some importance as containing the fruit trees well known as the apple, pear, &c. The species are natives of the temperate parts of the Old World. They are bushy trees, often spiny, with simple entire leaves, and large, generally white, flowers. One of the best known species is the common pear tree, *P. communis*, a native of woods in many parts of Europe, and now extensively cultivated everywhere in temperate climates. In its wild state, the pear tree has spines on its branches, and its fruit is small and harsh to the taste. When cultivated, the spines disappear, and the fruit becomes large, succulent, and very sweet. The varieties of pears produced by cultivation are very many, at least 600 having been enumerated. The pear is too well known to need any description; but besides its delightful addition to the table, a delicious beverage is procured from it, called perry. The wood of the tree is heavy, of a fine grain, and capable of taking a beautiful polish. When coloured black, it is difficult to distinguish it from ebony. The apple has been considered by some botanists a distinct genus from the pear, and the species have been described under the name of *Malus*. The common apple, *Pyrus Malus* (*Malus commu-*

nis), is a native of woods and hedges throughout the greater part of Europe. In its wild state it is a small bushy tree, known by the name of crab, but when cultivated obtains a considerable size. The varieties of apples are many, several hundreds having been enumerated. They are very much used as an article of food, and the cultivation of the different kinds gives employment to thousands. A delicious beverage is procured from them, called cider. The bark of the apple tree is astringent and tonic, and furnishes also a yellow dye; and the wood, though inferior to that of the pear tree, is employed for various purposes. It affords good charcoal. *P.* (*Malus*) *acerba* is a species which grows wild in the woods of the northern parts of Europe, but is not regarded by many botanists as distinct from the last. The apples are very sour, and not eatable, but they are used in the manufacture of cider. The manufacture of this beverage is one of considerable importance. The cider counties of England are Hereford, Monmouth, Gloucester, Worcester, Somerset, and Devon. The four first produce upwards of 30,000 hhds. a-year, Worcester furnishing of this more than 10,000. Half a hogshead of cider may be expected, in ordinary seasons, from each tree in an orchard in full bearing. Large quantities are also imported into this country from France and America. In this latter country, the apples grown in the neighbourhood of New York are considered the best. In 1841, the exports of those from the United States amounted to 25,216 barrels, valued at 48,396 dollars. *P.* (*Malus*) *paradisiaca*, the paradise apple, is a native of Southern Russia, and is a shrub from twelve to fifteen feet high. The flowers are of a rosy colour, and the apples are small, rounded, and are known by the name of the apple of St. John, from its ripening in the month of July. Several other species of *Pyrus* bear edible fruit, and two or three have been lately introduced into this country as ornaments to our parks and shrubberies. Amongst the species whose fruit is not of any importance is the mountain ash, *P. aucuparia*. This pretty little tree is found in most parts of Europe, in the north-west of Asia, in Nova Scotia, and other parts of North America, and in the island of Japan. In Scotland, where it is called the rowan tree, it grows wild at the sides of all our little rocky streams in hilly districts, and acquires its greatest size in the Western Highlands, and on the west coast. The flowers are small and collected in a corymb, and are sweet-scented. The berries are bright red, small, and of a very astringent taste. It is a graceful tree, and in Scotland, and the north of England, has enjoyed, from remote times, a distinguished reputation. Indeed, until very recent times, it was held in great esteem as a charm against evil influences. It grows rapidly, forms excellent coppice wood, and the bark contains a sufficient quantity of tannin to make it useful to tanners. The service tree, *P. domestica*, has very compact wood, and is said to be the hardest and heaviest of any indigenous to Europe. The quince belongs to this family—see CYDONIA; the medlar also—see MESPILUS. The Japan fruit, called loquat, is the produce of *Eriobotrya japonica*.

Pompilides. — A sub-family of fossorial hymenopterous insects belonging to the family *Spheginæ*. The abdomen in these insects is attached to the thorax by a very short peduncle, the legs are very long, and they are generally known by the name of sand wasps. They are amongst the most ferocious of the insect tribes, and some of the exotic species are the largest of all the hymenoptera. The genus *Pompilus* is the type of the sub-family. The species are British, are exceedingly active, burrow in the sand, and provision their cells with spiders, ants, &c., which they first sting to death.

Pompilus. *Sand Wasp.*—See POMPILIDES and SPHEGIDÆ.

Pontederiaceæ (after *Pontedera*, an Italian botanist).—A nat. ord. of monocotyledonous plants, of which the genus *Pontederia* is the type. The species belonging to this genus are herbs, stemless, aquatic, or natives of marshes, and indigenous to America, the East Indies, and Africa. The leaves are sheathing at the base, heart-shaped, or sagittate, and the flowers frequently of a celestial blue. *P. cordata* is a fine handsome plant, and is often cultivated for the purpose of adorning ponds and ornamental pieces of water. It is a native of different parts of the United States, Mexico, and Brazil. Some of the species are employed by the native Indian practitioners in liver complaints and diseases of the stomach.

Pontella.—A synonym of *Pontia*, a genus of *Entomostraca*.

Pontia.—A genus of butterflies. See PIERIDÆ.

Pontiadæ.—A family of *Entomostraca*. See COPEPODA.

Pontobdella.—A genus of leeches. See ANNELIDA.

Pontonia (πόντος, the sea).—A genus of crustacea belonging to the *Decapoda Macroura*, and family *Alpheidæ*. In general appearance they resemble the palæmons, but are remarkable for having the second pair of feet much larger than the first pair. The front of the carapace is armed with a short, robust, and inflected rostrum. *P. tyrrhena* is a native of the Mediterranean, and is found lodged within the valves of the large pinna, in the same manner as *Pinnotheres*. Aristotle appears to have observed this animal, for he mentions a *squilla*, as well as a little *crab*, having been found inside the shell of these molluscs.

Populus. *The Poplar Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, and sub-order *Salicineæ*. The species are deciduous trees, often of a great size, and

found growing in Europe and North America, in Asia and North Africa. Many of them are of great utility, and others are valuable as ornamental timber. *P. alba*, the white poplar, or abele, is a fine tree, and well known as a native of Great Britain, France, and most parts of Europe, in humid soils. It is one of our loftiest trees, growing sometimes to the height of 90, or even 100 feet, with a trunk from three to four feet in diameter. It is of very rapid growth, and its roots extend to a great distance along the ground, at a little depth below the surface. As it throws out a great many suckers, it proves hurtful to cultivated grounds. The wood is white, with sometimes a slight tinge of yellow near the centre; it is light and tough, and its roots are very much esteemed for making articles of furniture. *P. tremula*, the aspen, is a native of almost all parts of Europe, extending as far as Siberia. Its leaves hang pendulous from the extremity of long, very compressed petioles, which causes them to have a constant tremulous motion, and has rendered the tree well known from its poetical associations. The wood is white and tender, and is useful for many purposes. The charcoal prepared from it is said to be well adapted for the manufacture of gunpowder. *P. nigra*, the black poplar, is a common species in Great Britain, and in many other parts, but more especially in the temperate parts of Europe. It is a lofty tree, from seventy to eighty and even ninety feet in height, and upwards of three feet in diameter. It divides into long branches, which form at the top a large and conical cyme. It grows rapidly, but is not long lived, and it is said ought to be cut down when about fifty years old. The wood is tougher and more fibrous than any other species of poplar, and is much used for many purposes by carpenters and cabinetmakers. The bark contains a good deal of tannin, and is employed along with oak bark in tanning skins. It yields a yellow dye. The scales of the young buds are covered with an aromatic resinous matter, which is believed to furnish bees with a great proportion of the substance called "propolis." *P. fastigiata* is the Lombardy poplar. This tree—which is a native of Italy, on the banks of the Po, as well as of Persia and the Himalaya—grows rapidly, and attains a height of from 100 to 120, and even sometimes to 150 feet. *P. monilifera* is the black Italian poplar, and though not a native of Great Britain, grows to a great size here. One of the finest and largest, and perhaps also one of the oldest specimens of the species in Britain, is now growing at Maxwell-heugh, near Kelso, in Scotland. The trunk, at the base, measures thirty-one feet in circumference, and at the height of 16½ feet divides into several enormous branches, which form a large head. Its solid contents are found to be upwards of 900 feet, and yet it is little more than sixty years old. *P. balsamifera* is one of several useful species which are natives of North America. It is there known by the name of the tacamahac tree. It grows to the height of about eighty feet; the wood is odoriferous, and abounds in a balsamic secretion, which is known by the name of "tacamahaca" and "baume focot."

Porcellana.—A genus of *Crustacea* belonging to the order *Decapoda*, tribe *Anomoura*, and forming the type of a family to which it gives its name, *Porcellanidæ*. It contains several species, some of which are common on our coasts, living under stones. They are distinguished by having a fan-like caudal fin, and a rather narrow suborbicular carapace, depressed above.

Porcellio.—A genus of *Crustacea* belonging to the order *Isopoda*, and forming part of the family *Porcellionidæ*. The species are distinguished by the formation of the antennæ, which are large, and composed of seven or eight joints. They inhabit gardens and damp places, under stones, logs of wood, &c. The female carries her eggs, and also her young, under her thorax. Their food consists of animal and vegetable matters.

Porifera (*porus*, a pore; *fero*, to carry).—The class to which sponges belong. See SPONGIDÆ.

Porphyrio.—A genus of grallatorial birds. See RALLIDÆ.

Porphyry (πορφυρα, purple).—A rock having a basis of felspar, or clay, &c., with crystals of some other mineral interspersed through it. The term is often applied to a number of rocks of an igneous origin, both ancient and comparatively modern. Syenitic porphyry is the kind to which the fine varieties of ancient porphyry belong, and is one of the oldest primitive rocks. It is generally of a reddish colour, though occasionally it presents greenish, gray, or brown tints. It is much employed in decorative architecture, the beauty of its polish, its colour, and solidity making it to be much valued, though its extreme hardness renders it expensive to work.

Porpita.—A genus of marine animals. See ACALEPHÆ.

Portax.—A genus of antelopes. See STREPSICEREÆ.

Portulaca. *Purslane.*—See PORTULACACEÆ.

Portulacaceæ.—A nat. ord. of dicotyledonous plants having a great affinity to the *Caryophyllaceæ*. The species are numerous, and consist of succulent herbs, or under-shrubs. They are found in various parts of the world, but chiefly in South America and the Cape of Good Hope. They possess few remarkable properties, but some of them are used as pot-herbs. The genus *Portulaca* is the type, and is composed of small, fleshy, herbaceous plants, a great portion of which are natives of South America, only a few being found in the Old World. Their leaves are thick, cylindrical, or flat, and their flowers, often brilliant in colour, are solitary, and sur-

rounded at the base with leaves which form an involucre. The petals are very short-lived; they blow in the morning, and at night they become resolved into a gelatinous matter. One of the species, *Portulaca oleracea*, the common purslane, is cultivated as a pot-herb. It is little used in this country, but is grown in most kitchen gardens throughout France. It is used either as a salad, pickled, or cooked in various manners. Two or three other species, as *P. Gilliesii* and *P. grandiflora*, natives of South America, are cultivated in Europe for the beauty of their flowers, which are large and of a fine purple-red colour. Some species of the genus *Claytonia* are also used as edible herbs. See CLAYTONIA.

Portunus.—A genus of short-tailed decapodous crustaceans. See BRACHYURA.

Potamia (ποταμος, river).—A synonyme of *Boscia*, a genus of terrestrial crabs belonging to the family THELPHUSIDÆ.

Potamides (ποταμος, river; ειδος, species).—A genus of mollusca. See CERITHIDÆ.

Potamogeton (ποταμος, river; γειτων, neighbour).—A genus of aquatic plants. See NAIADACEÆ.

Potentilla (*potens*, powerful, from its supposed powerful qualities).—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*. The species are numerous, about 150 having been described. They are for the most part herbaceous, rarely fruticose, and are found chiefly in the temperate and colder countries of the northern hemisphere. The leaves are alternate, digitate, or pinnate, and the flowers yellow, or white, and disposed in terminal corymbs. Botanists now unite the genus *Tormentilla* with *Potentilla*, or consider it at best only a sub-genus. The true *Potentillæ* have the limb of the calyx divided into five parts, and the petals are five, whilst in the *Tormentillæ* the calyx consists of four divisions only, and the petals are five. *P. anserina*, goose grass, or goose foot, is an extremely common plant on all our road sides, and is said to be a great favourite with geese, who devour its leaves with great relish—hence its common English name. The flowers are sweet-scented. The plant is used sometimes as a pot-herb, and the roots are eaten, and when roasted, or boiled, taste like parsnips. In the Western Islands of Scotland they have been known to support the inhabitants for months together in times of scarcity. The root of *P. reptans*, or creeping cinquefoil, another very common plant in our road sides and borders of fields, has been considered to possess astringent qualities, and has accordingly been used in medicine in the cure of intermittent fevers. *P. Tormentilla* (*Tormentilla officinalis*), or common tormentil, is one of the most abundant plants we have in Great Britain, and is equally common in many other parts of Europe. The root is thick, rounded, and possesses a great proportion of tannin and red colouring matter. In medicine it is much esteemed as an astringent, and though not much employed by physicians in the present day, maintains a high reputation in many of our rural districts, where it is extensively used, boiled in milk, in cases of diarrhœa and dysentery. In the north of Europe, as in Lapland, &c., and in the Western Isles of Scotland, it is used for tanning leather, and for dyeing a red colour. In some of our districts in Great Britain it is considered an excellent remedy for some diseases of sheep, such as the *braxy*, and the *Loupin-ill*, or that disease in which the sheep leap into the air when a person approaches them, and fall down apparently dead.

Poteriocrinites.—A fossil genus of echinoderms. See CRINOIDEÆ.

Poterium (ποτηριον, a drinking cup).—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*. The species are herbaceous, rarely fruticose, with alternate pinnate leaves and flowers in terminal panicles. *P. sanguisorba*, the common burnet, is not uncommon in Great Britain, and was at one time cultivated as fodder for cattle, though now superseded by saint-foin, &c. In some parts of the continent it is considered a valuable plant, as a means of making good pasture upon poor, dry ground. The leaves have been used as a salad, and they are said to form one of the ingredients in the once popular "cool-tankard." The custom of infusing it in liquors has given the name to the genus.

Pouches.—Sacs or hollow spaces situated in the interior of certain mammalia, and in which these animals can place their food, either to keep it for a time, or to transport it from one place to another. "Cheek pouches" exist only in frugivorous and granivorous animals. Amongst the quadrumana or monkeys they only occur in those which are peculiar to the Old World, and in those are only of moderate size. In the hamsters, *Cricetus*, amongst the rodentia, they are on the contrary very large, and are prolonged on to the sides of the neck. In *Nycteris*, an animal which belongs to the order *Cheiroptera* or bats, the cheek pouches are perforated at the bottom, and communicate by means of these with large sacs in the subcutaneous tissue. These sacs or pouches the animal can fill with air at pleasure, so as to augment the volume of its body, and consequently its specific gravity. When thus distended the animal looks like a little balloon fitted with wings, a head, and feet.

Prangos.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*. There is only one species as yet described. This plant, *P. pabularia*, or prangos hay plant, is a native of Southern Tartary, and is herbaceous. The leaves are about two feet in length, and have a highly fragrant smell, very similar to that of good new clover hay. It has been highly extolled as fodder for cattle, being said to produce fatness in a very short time, and to

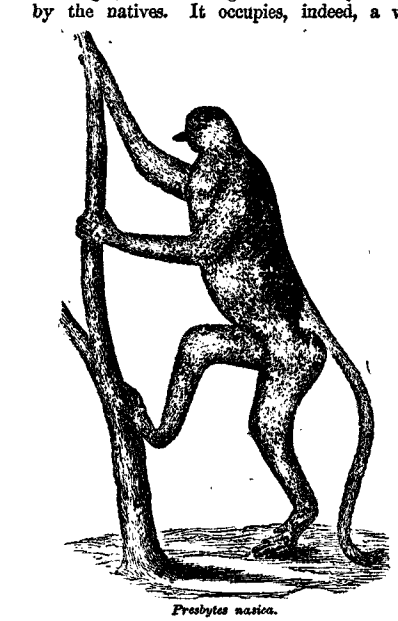
be destructive to the fluke-worm, *Fasciola hepatica*, which in Great Britain is so injurious to sheep.

Praniza.—A genus of *Crustacea*. See ISOPODA.

Prehnite (after *Col. Prehn*).—A mineral substance composed of silica, alumina, lime, iron, and water. It is of a more or less vitreous appearance, and is translucid, transparent, and of a green colour. It scratches glass easily, and becomes electric by heat. Specific gravity 2·9 to 2·953. It is found at the Cape of Good Hope, at Kilpatrick in Scotland, in the United States, &c.

Presbytes. See PRESBYTINA.

Presbytina (πρεσβυς, blind).—*The Capped Apes.* A sub-family of quadrumanous animals belonging to the family *Simiidæ*. The species are natives of Asia, and are characterized by having a small head, which is in general furnished with a tuft of long hair, a lengthened tail entirely covered with hair, and not prehensile. The limbs and hands are elongated, the body is slender, and the thumbs of the fore hands are small and placed far back. They are able to leap to great distances, are generally mild and placid when young, but as they advance in age become dull and morose. *Presbytes Entellus*, the hoonuman of the Hindoos, is a native of Bengal, and has religious honours paid to it by the natives. It occupies, indeed, a very



Presbytes nasica.

prominent station among the Hindoo divinities. *Presbytes Maurus*, the lotong or budeng of the natives, is found in Sumatra and Java. They live in the forests in large troops of more than fifty individuals, feeding on wild fruits of every description, and when approached utter loud screams. They are often hunted for their fur, which is used for horse equipage and military ornament. The proboscis monkey, *Presbytes nasica* (*Nasalis larvatus*), is remarkable for the size of its nose, which is four inches in length, and has the nostrils opening on the under surface of its tip. It is an animal of considerable size, being upwards of two feet in length from the tip of its nose to the root of its tail, and this latter organ is rather longer than the body. The proboscis monkeys live in large troops in the forests of Borneo, and they assemble morning and evening upon the trees by the side of streams, darting with great agility from tree to tree, and sometimes springing a distance of from fifteen to twenty feet. The Cochin-China monkey, *Presbytes Nemæus*, is a very large species, measuring in an upright position 3½ or four feet in length, and is distinguished by the singular variety and brilliancy of its colours. It is a native, as its name imports, of Cochin-China, and is called the douc by the natives.

Priapulus (*Priapus*, a mythological name).—A genus of echinodermatous animals belonging to the family *Holothuriidæ*. One species, *P. caudatus*, is a native of the coast of Norway, and lives in the muddy sea banks.

Primates.—The first grand division of the class mammalia, and so called because the species belonging to it are considered the most perfect of animals. The chief characters are—distinct and well defined incisive, canine, and molar teeth, placed in a regular uninterrupted series; two mammæ or teats placed on the chest, and the front extremities, and generally the hinder also, terminating in a hand which is provided with an opposable thumb. The brain in the primates is much more developed than in any other of the mammalia. This order includes man, HOMO; the monkeys, SIMIIDÆ; the lemurs, LEMURIDÆ; the flying lemurs, GALEOPITHECIDÆ; and the bats, VESPERTILIONIDÆ.

Primnoa (mythological name).—A genus of zoophytes. See ANTHOZOA.

Primula (diminutive of *prima*, the first; on account of its early flowering).—*The Primrose.* See PRIMULACEÆ.

Primulaceæ. *The Primrose family.*—A nat. ord. of dicotyledonous plants, containing a number of very pretty and well-known species. They are herbs, natives chiefly of the temperate regions of the northern hemisphere, especially in Europe and Asia, some of them ascending even to the tops of lofty mountains. The flowers are solitary, and are arranged in an umbel at the extremity of a peduncle. Their roots contain an acrid volatile principle or a bitter resin. The genus *Primula* is the type of the family, and in it are several species which are great favourites with the horticulturist. *P. officinalis*, the prim-

rose, is a plant which abounds in the woods and meadows of England and throughout all Europe. The leaves are rugose, glabrous above, and the flowers are yellow, disposed in single-flowered scapes, and turned towards one side. *P. veris*, the cowslip, is even a greater favourite than the primrose itself. It resembles it very much in its leaves, but is distinguished by the formation of its calyx, and its flowers being disposed in many-flowered umbellate scapes. At one time these plants were much esteemed in medicine, but they are now disused, though the flowers of the cowslip appear to have sedative and diaphoretic qualities, and make a pleasant soporific wine. They are much cultivated as ornamental plants, and many varieties are produced by the gardener. The oxlip, *P. elatior*, is a rare plant in England, though common in woods and meadows in various parts of Europe. The well known *Polyanthus* is a variety of this species. The auricula, *P. auricula*, is another well known species. It is a native of the Alps of France and Switzerland, of the Apennines and the Carpathian mountains as far as Atlas. The flowers are red or yellow in the wild state, and are sweet-scented. This species is very much cultivated in our gardens, and sports into great variety under the care of the horticulturist. Of the exotic species, one of the most esteemed and most beautiful is the Chinese primrose, *P. sinensis*. It has been imported from China, and requires care in rearing. Amongst the other genera of the family *Primulaceæ*, we may particularly refer to the sowbread or CYCLAMEN; the pimpernel or ANAGALLIS, and TRIENTALIS.

Prinos (πρῖνος, holly).—A genus of plants. See AQUIFOLIACEÆ.

Prion.—A genus of birds belonging to the order *Anseres*, and family *Procellariidæ*. The species belonging to this genus form part of that great group of oceanic birds known by the name of petrels, &c. They are met with in the open ocean, and follow ships for immense distances.

Prionodon.—A genus of carnivorous animals belonging to the order *Ferœ*, family *Felidæ*, and sub-family *Viverrinæ*. The genus was founded on an animal found in Java, and called by the natives the delundung, but had previously been described by Müller under the name of *Linsang gracilis*. Another species has since been found in the mountainous regions of Nepâl.

Prionus.—A genus of insects belonging to the order *Coleoptera*, section *Longicornes*, and forming the type of the family *Prionidæ*. There are about a dozen species, some of which are of considerable size. The perfect insects are found settling upon trees, and are only to be seen flying in the evening or during the night. The large, *P. cervicornis*, a native of South America, is said to saw off the branches of trees with its large mandibles. The larva lives in the substance of old trees, and when full grown forms a large cocoon, chiefly composed of chips of gnawed wood, wherein it passes its pupa state. Before it undergoes its change, however, it has the instinct to bore its hole close to the outer surface of the tree, so that the perfect insect may the more readily effect its escape. These larvæ are eaten by the natives of South America.

Pristis. *The Saw-fish.*—A genus of chondropterygious fishes belonging to the family *Squalidæ*. The body of these fishes is round and conical posterior to the pectoral fins, but becomes broader and depressed towards the upper part of the body and head. *P. antiquorum* is the well known saw-fish, so called from the muzzle being extended into a long flat blade armed on each side with a row of sharp long spines, so as to resemble a large-toothed saw. This fish is widely distributed, being found in the arctic, antarctic, and tropical seas, and sometimes attains the length of twelve or even fifteen feet. A fish of this size, wielding such a powerful weapon, becomes a formidable enemy to the largest whales, which it does not fear to attack, inflicting the most severe wounds. There are several other species, which are met with in various localities in the open ocean. They are very rapid swimmers. Some naturalists place the genus pristis among the rays, or family *Raiidæ*.

Proboscidea, or **Proboscidifera** (*proboscis*, a trunk; *fero*, to carry).—A group of animals belonging to the class *Mammalia*, the term being employed by some zoologists to designate those large quadrupeds which are characterized by the elongation of the nose, and which is called the proboscis—such as the elephant, tapir, rhinoceros, &c., amongst recent animals, and the dinotherium, &c., amongst extinct fossil quadrupeds. It is nearly synonymous with PACHYDERMATA.

Procapra.—A genus of antelopes. See ANTILOPEÆ.

Procellariidæ.—A family of birds belonging to the order *Anseres*, and including two subfamilies; *Procellarinæ*, containing the petrels, puffins, &c., and *Diomedeinæ*, containing the albatrosses.

Procellariinæ. *The Petrel family.*—A subfamily of oceanic birds belonging to the family *Procellariidæ*, and characterized by their beak being as long as the head, formed of several pieces, and sharply hooked at the tip, their nostrils tubular at the base or on the side of the bill, their hind toe elevated, and consisting merely of a claw, and the tarsi being reticulated and usually shorter than the middle toe. The petrels are entirely oceanic birds, being generally found far out at sea, at a great distance from any land. Their flight is rapid and powerful, and apparently they can keep it up for days and nights together, as the same birds may be seen flying round ships at sea, and keeping company with them for a length of time. When the sea is agitated, and the winds high, then the petrels

may be seen in great abundance, seeking their food in the midst of the agitated waves. They have the faculty also of running lightly on the surface of the water, and with considerable rapidity. Hence, it is said, is derived the name petrel—the early navigators who met with these birds comparing them, on account of this habit of walking on the water, to St. Peter—*Peterill* being a diminutive of *Peter*. It has been remarked that these birds, when flying, do not flap their wings, but sail along with them widely extended, and apparently giving them little or no motion. They live chiefly on molluscous animals and crustaceans, sometimes on the dead bodies of cetaceans, and but rarely seize upon fish. They seldom seek the land, except at the breeding season. The stormy petrel, or Mother Carey's chicken, *Procellaria pelagica*, is a well known bird, and is constantly met with, following in the wake of ships out at sea. It builds its nest in the holes of rocks on the coasts of Great Britain, especially in the island of St. Kilda, many other parts of Europe, and North America. Several other species, bearing a general resemblance to each other, as *P. Wilsonii*, &c., have received from sailors the name of Mother Carey's chickens, and are thought by them to forbode stormy weather. They are all, comparatively speaking, of a small size, and of a dark hue, more or less relieved with white. Their flight equals in swiftness that of the swallow tribe, which they resemble in size, colour, and general appearance. They constitute the genus *Procellaria* as now restricted, but form part of the genus *Thalassidroma* of some ornithologists. The giant petrel, *P. gigantea*, is a large bird, found in the Southern Ocean, and is called "quebrantahuesos," or break-bones, by the Spaniards. It is more rapacious than the other petrels, and resembles in general appearance, though not in colour, the albatross. It lays its eggs on the sandy shores of the Malouine Islands, and there they are to be met with in immense numbers, and their eggs may be seen lying about in prodigious quantities. It forms the type of the genus *Ossifragus*. The Cape pigeon, *P. Capensis*, forms the type of the genus *Daption*. It is met with in great numbers in the Southern Ocean, along with the albatrosses, the gigantic petrels, and prions. It is of a white colour, variegated with brown, and is upwards of a foot in length.

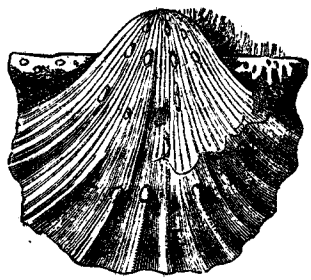
Procerus.—A genus of beetles. See CARABIDES.

Procnias.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Ampelidæ*. The species are natives of Brazil, and are remarkable for the enormous width of their mouths, which enables them to swallow the large berries of the *Melastoma* and other tropical shrubs, upon which they feed. *P. ventralis*, the swallow fruit-eater, is about 5½ inches long, and the male is of a blue colour, while the female is green.

Proctotrupidæ (πρωκτος, anus; τρυπαω, sting).—A family of insects belonging to the order *Hymenoptera*, allied in general appearance to the *Ichneumonidæ*, and like them depositing their eggs in the bodies of other insects. The perfect insects are of a dark colour, and are distinguished by having the wings entirely destitute of, or with but very few veins. The species are generally very small, some of them being so minute as to be visible to the naked eye only when creeping up the glass of windows opposed to the light.

Procyon. *The Raccoon.*—See URSIDÆ.

Producta.—A genus of fossil shells belonging to the class *Brachiopoda*, and forming the type of a small family, *Productidæ*. About sixty species are described, all belonging to the



Producta pygilla.

transition rocks. The shells are inequivalve, symmetrical, often inequilateral, the ventral valve being large and convex, while the dorsal is flat and concave. The outer surface is furnished with tubular spines. They are not perforated like the *Terebratulæ*, but may nevertheless have been attached by a pedicel when young.

Promeropidæ.—A family of birds. See NECTARINIDÆ.

Propithecus.—A genus of animals belonging to the class *Mammalia*, order *Primates*, and family *Lemuridæ*. The genus was formed to receive a species of the lemur family, found in Madagascar, and named *P. diadema*. It differs from the genus *Lemur* in the number and form of its teeth, the incisors of the upper jaw, four in number, constituting a regular series.

Proscopia (προ, forwards; σκοπεω, to look).—A genus of insects belonging to the order *Orthoptera*, and family *Locustidæ*. The species are natives of Brazil, are of a long and cylindrical form, having the head projecting much forwards, the eyes large and prominent, and both sexes destitute of wings. They have the general appearance of the wingless *Phasmæ*, and seem to constitute a connecting link between these insects and the locusts. About thirty species have been described, all of pretty large size and of a sombre colour.

Prosthemadera.—A genus of birds belong-

ing to the tenuirostral tribe of the order *Passeres*, and family *Meliphagidæ*. The curious bird called poe-bird, *P. cincinnata*, belongs to this genus. It is a native of New Zealand, and possesses remarkable powers of imitation. There is not a note of any other bird but what it exactly imitates. When confined in a cage, it learns with great ease and correctness to speak long sentences, barks like a dog, mews like the cat, gabbles like the turkey, cackles like poultry, and imitates any sound which is repeated a few times in its hearing. It is hence called the "mocking bird of New Zealand;" and as its plumage is a glossy black, it is also known by the name of "parson bird." It is about the size of the thrush, feeds upon flies and other small insects, and is itself delicious eating.

Protea.—A genus of plants See PROTEACEÆ.

Proteaceæ.—A nat. ord. of dicotyledonous plants, composed for the most part of evergreen shrubs or trees of moderate height, with hard, dry leaves. The species are almost entirely confined to the southern hemisphere, are tolerably abundant in South America, and still more so at the Cape of Good Hope, Australia, and New Zealand, in which latter countries they form a peculiar feature in the vegetation. The genus *Protea* is the type, and gives its name to the family. With one exception, all the species are natives of the Cape of Good Hope. Their leaves are entire and coriaceous, and the flowers are in terminal heads. They are very pretty shrubs, and are worthy of being cultivated, though in this climate much care must be taken of them. The elegant protea, *P. speciosa*, is one which appears in our gardens, and is a fine large shrub, with flower heads the size of a small artichoke. The heart-leaved protea, *P. cordata*, is perhaps, however, the most beautiful of all the known species, and was introduced into England in the year 1790. Its large coriaceous, heart-shaped leaves, edged with red, and its lateral flowers, surrounded with bright scarlet bracteæ, give it a fine appearance. There are many other genera belonging to this family, a considerable number of which are named after celebrated botanists or patrons of the science—as BANKSIA, DRYANDRIA, &c. They are for the most part much prized by gardeners, and form a part of every good collection of plants. One of the finest collections in this country is at Kew gardens, where a great variety may be seen.

Proteles.—A genus of animals belonging to the carnivorous *Mammalia*, order *Ferœ*, family *Viverridæ*. The typical and only species, *P. cristata*, is a native of the Cape of Good Hope, where it is known by the name of the Aard wolf. It is a sort of intermediate animal between the hyænas and civets. The hinder extremities, provided with four toes, and bent in such a way as to make them appear much shorter than the fore legs, and its fur barred by transverse bands, give it a general resemblance to the common hyæna. The head, however, being more slender and better proportioned, makes it approach more nearly the civet; whilst its fore feet are provided with five toes and a thumb, in position and size like that of the dog. When full grown, the Aard wolf is about the size of a shepherd's dog. The ears are long, pointed, and hairy; a crest or mane of rough hairs runs along the whole length of the back, and the tail is like that of the fox. It is rather a rare animal, and as its habits are nocturnal, it has been little observed in its native habitats. During the day it lives in burrows, which it makes with facility by means of its strong fore claws. These burrows have several entrances, and the animals appear to live in society, three or four individuals inhabiting the same hole. When irritated, it raises its mane along its whole extent, and immediately takes to flight, running very swiftly, with its body obliquely bent, its ears pointed backwards, and its tail lowered to the ground. It preys upon small rodent animals, is said to have a great liking for the fat tails of lambs, and eats carrion also.

Proteolepas.—A genus of cirrhipeds. See CIRRIPEDIA.

Proteus (mythological name).—A genus of *Amphibia*. See SIRENIDÆ.

Protococcus (πρωτος, first; κοκκος, seed).—A genus of minute confervoid *Algæ*, belonging to the family *Palmellaceæ*. The species consist of globular cells, of a green or red colour, the true history of which, however, is still at present but imperfectly known. The species are numerous, and are found chiefly in moist, damp places upon the ground, on rocks, upon snow, or on the surface of standing water. The red snow of the polar regions used formerly to be considered to be coloured by the presence in it of a species of this genus, *P. nivalis*, though now it is believed to be a species of the genus *Palmella*. A common British species, *P. viridis*, is frequently to be seen on damp earth, sand, &c., vegetating sometimes in large surfaces, and forming a greenish coat of no perceptible thickness. Its zoospores occur constantly on the surface of pools of standing water in spring and autumn, and tinging it with light green. *P. pluvialis* is another species which occurs in Britain, on the surface of snow, on the tops of mountains. When the snow melts it colours the water red. It has lately been observed that these plants at times produce forms which closely resemble many species described as infusorial animalcules.

Protonopsis (πρωτονος, a cord; οψις, appearance).—A fossil reptile. See PSEUDOSAURA.

Protopterus.—A genus of *Amphibia*. See LEPIDOSIREN. According to Professor Owen the *Lepidosiren* belongs to the class *Pisces*, and not to the *Reptilia*, and forms a link connecting the higher cartilaginous fishes with the sauroid genera, *Polypterus* and *Lepidosteus*; whilst, at the same time, it makes the nearest approach in

the class of fishes to the perennibranchiate reptiles.

Protorosaurus (πρωτιστος, first; σαυρος, lizard).—A genus of fossil reptiles belonging to the order *Sauria*, and known as the fossil monitor of Thuringia.

Protozoa (πρωτος, first; ζωον, animal).—A term applied by some zoologists to the lowest forms of animal life, and corresponding at the present day with the true *Infusoria*.

Prunus.—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*, and sub-order *Amygdaleæ*. This genus contains the fruits so well known as plums. One of the species called the cocumiglia, *P. cucumilia*, or *coccomilia*, is a native of Calabria, and enjoys the reputation of being a powerful febrifuge. The bark is used both in private practice and in the military hospitals of that district, for the cure of the intermittent fevers of the country, and is preferred to *Cinchona*. For the other species, see AMYGDALEÆ.

Psammobia (ψαμμος, sand; βιος, life).—A genus of bivalve *Mollusca* belonging to the family *Tellinidæ*. About forty recent species are described, and twenty-four fossil.

Psaris.—A genus of birds, synonymous with *Tityra*. See MUSCICAPIDÆ.

Pselaphus.—A genus of minute coleopterous insects, the largest not exceeding one-twelfth of an inch in length. They prey upon other insects smaller than themselves, and are found under stones, and amongst herbage in damp situations, or under the bark of trees and in putrid wood. The species of the genus *Claviger*, a closely allied genus, are found in ants' nests.

Pseudophus.—A genus of reptiles. See BIPES.

Pseudosaura (ψευδος, false; σαυρος, lizard).—An order of animals belonging to the class *Amphibia*. Their body is elongate, lizard-like, and they possess a tail. They undergo no change in the course of their life. The gills are rudimentary, internal, and they have an orifice or gill aperture on each side of the neck. They respire by lungs. The genus *Protonopsis* has a large flat head, and jaws with a series of minute teeth. They have also a parallel range of teeth on the palate. *P. horrida* is a well known American species found in the Ohio and Alleghany rivers. It is two feet long, is carnivorous, and very voracious. Nothing that can be eaten is spared, so that the fishermen dread it very much. They believe it to be poisonous, and it is called the hell-bender, mud-devil, or young alligator, by the inhabitants. *Sieboldia maxima*, found in Japan by Siebold, is the nearest living analogue of the fossil salamander found by Scheuchzer, and called *Andrias Scheuchzeri* or *Homo diluvii testis*. The *Amphiumæ* abound in the marshes and lakes of North America. Though they are capable of existing on land, they seldom abandon the watery element. They are generally found burrowing in the mud in ponds and swamps near streams, where, as winter approaches, they take up their quarters for the season, and in spring are often turned out in great numbers when the inhabitants are cleaning out the ponds and ditches. The body of the *Amphiumæ* is long, and the extremities are remarkably small, resembling small tentacula rather than legs.

Psithyrus.—A genus of hymenopterous insects belonging to the family *Apidæ*. In general appearance these bees so closely resemble the common humble-bees, *Bombus*, that they were long confounded with them. They differ, however, in the structure of their hind legs, and still more in their habits. It appears they make no nests of their own, but like the cuckoo amongst birds, select the nests of other bees in which to deposit their eggs. It is the nests of the humble-bees, which they resemble so much, that they choose for this purpose.

Psittacidæ. *The Parrot family.*—An extensive family of birds belonging to the order *Scansores*, and corresponding in situation in zoological arrangement, amongst birds, to the *Quadrumana* amongst mammalia. The characteristics of this family are—a large, hard, solid beak, rounded on all sides; the upper mandible sharply hooked at the tip, the lower notched at the extremity; the tongue thick, fleshy, rounded, and either terminated by a bundle of horny papillæ or a simple cartilaginous gland. They are the most typical of the order (*Scansores*, or climbers), to which they belong. Their toes, four in number, and armed with strong claws, are placed two and two opposite each other; the two anterior being united at the base by a narrow membrane, the posterior being entirely free. When feeding they use one of their feet as a hand with which to hold the substance they are eating. The formation of the upper mandible is very remarkable. It is articulated to the forehead, and its power of motion is more highly developed than in any other family of birds. They are thus enabled to seize large objects with ease. From the construction of their tongue and their complicated lower pharynx, these birds have the faculty beyond all others of imitating the human voice. To such an extent indeed are they endowed with this faculty that they are generally said to *talk*. Parrots were well known to the ancients, and they have been celebrated in the verses of many of the Greek and Latin poets. The first specimens were introduced into Europe by the followers of Alexander the Great, and one species has in consequence been named after the Macedonian hero. They are natives of the hot parts of Asia, Africa, America, and Australia, but have never been found in any part of Europe. They are often adorned with lively and brilliant colours; red, green, blue, and yellow predominating. Parrots have a peculiar method of climbing. Their movements appear slow and almost painful to the look. They seize hold of a branch with the tip of their hooked

beak, and supported by this they draw the feet up, one after another; and when they wish to descend a tree, they make use of this same organ, placing the back of it against the branch as a fulcrum. The greater number are sedentary birds, but they are able to fly well, and with considerable swiftness. Their walking motion upon the ground is, however, slow and awkward.

1. *Nymphicus Novæ Hollandiæ*—Crested parrakeet. 2. *Chrysotis Augustus*. 3. *Palæornis Pondicerianus*—Mustache parrakeet. 4. *Deroptyus accipitrinus*—Hawk-headed parrot. 5. *Coriphilus sapphirinus*—Otaheite parrakeet.

The food of the psittacidæ consists essentially of fruits; they eat with avidity plantains, bananas, guavas, oranges, &c., but it is fruits with hard kernels that they prefer. The coffee plantations, for instance, often suffer very much from their depredations. They generally live in large flocks, and are usually very active in the morning and evening. They are noisy, quarrelsome birds, though one or two species are the opposite. One in particular obtains the name of the love-bird, from their living in the greatest amity with each other in pairs. Parrots are exceedingly mischievous birds, and in the wild state are as hurtful to trees, &c., as they are found to be in captivity. They are monogamous, and build their nests in holes of trees, &c. When first hatched, the young are quite naked, and the head appears enormously large in proportion. They do not become perfectly feathered till they are three months old. The species are numerous, and as they vary much in appearance they have been divided into several sub-families —*Pezoporinæ*, *Arainæ*, *Lorinæ*, *Psittacinæ*, CACATUINÆ, and STRIGOPINÆ. The sub-family *Pezoporinæ*, or parrakeets, is composed of birds which differ from all the other parrots in the form of their tarsi. These are high and slender, and the claws of the toes are nearly straight; in consequence of which the birds belonging to it are able to walk more easily upon the ground than those of any of the other families. From their terrestrial habits the species of the genus *Pezoporus* are called ground parrakeets. They are all natives of Australia. The beautiful green and black marked New Holland parrakeet, *Pezoporus formosus*, may be taken as an example. It is active and graceful in its form and actions, but from its recluse habits and great powers of running, it is seldom seen. It is rarely seen on the wing, but when flushed it flies near the ground, though only for a short distance. Its flesh is excellent, being much more delicate than that of the snipe, and equalling if not surpassing that of the quail. The blue cheeked parrakeet, *Platycercus Pennantii*, is another New Holland species, and beautifully coloured with crimson-red, black, and blue. It is the most common species sent alive from Australia to this country, and in disposition is very tame and familiar. It is chiefly found on the ranges of grassy hills and brushes, and lays its eggs in holes in the gum trees. The best known parrakeets, however, are the Indian species, distinguished by their long tail and collar-like ring round their neck. They form the genus *Palæornis*. The ring parrakeet, *Palæornis Alexandri*, is believed to be the first species of any of the parrot family introduced into Europe. From its being supposed to be the spe-

cies brought by the followers of Alexander the Great, it has been named after him. These beautiful birds seem to have been great favourites with the Romans, who prized them highly, and lodged them gorgeously in cages of gold, ivory, and tortoise-shell. One or two species of parrakeets have a pleasing song, and are highly esteemed as cage birds. These belong to the genus *Melopsittacus*. The warbling grass parrakeet, *Melopsittacus undulatus*, is a lovely little bird, pre-eminent for beauty of plumage and elegance of form. It is also remarkable for its sprightly and animated manners. It breeds in the hollow spouts of the large *Eucalypti*, or gum trees, and may be seen in flocks of many hundreds feeding upon the grass seeds that are found in abundance on the plains. Their song is animated and pleasing, and when kept in a cage they are continually billing, cooing, and feeding each other. The sub-family *Arainæ*, have the beak very strong and much hooked at the point. The face is naked of feathers, and the tail is longer than the body. They are remarkable for their large size and finely coloured plumage, and are well known by the name of "macaws." The tropical regions of South America are the native places of these fine birds. They abound in the swampy grounds covered with palm trees, the fruit of which they are particularly fond of. The scarlet macaw, *Ara* (*Macrocercus*) *macao*, is perhaps the most splendid as well as the largest species of the whole parrot family. From the tip of the bill to the extremity of the tail, some of them measure thirty-six inches, and their plumage is of a bright scarlet colour relieved with blue, yellow, and green. The great green macaw, *Ara* (*Macrocercus*) *militaris*, is a native of the Andes, where it is found as high as 3,000 feet. In former times it was considered an acceptable gift when presented to the Incas by their subjects. It is a gregarious species, and in the predatory excursions these birds make, a watch is kept on some high station, the top of a tree generally, to warn the plunderers of the approach of danger. The macaws in general commit great devastation upon gardens and cultivated fields, and immense numbers are annually killed by the enraged husbandman. The Carolina arara, *Arara Caroliensis*, is found congregated in immense flocks. Richly plumed, when they alight on a stack, they look as if a brilliantly coloured carpet had been thrown over it. When feeding thus in great numbers close together, the sportsmen make immense havoc amongst them; for so eager are they upon their food, that though disturbed by the discharge of the gun, they quickly return to the same spot again, and thus fall an easy prey to the angry farmer. The sub-family *Psittacinæ*, the true parrots, have a variable beak both in form and size, and the upper mandible dentated on its edges. Their tail is short. They unite great beauty with great docility, and are natives for the most part of the torrid zone. To this sub-family belong those birds called true parrots, and which possess the faculty in the greatest perfection of imitating the sounds of the human voice. The gray parrot, *Psittacus erythacus*, an African species, living in Guinea, Senegal, &c., is of all others the one which bears the highest reputation in this respect, and of which so many wonderful tales are told. One such is recounted of a gray parrot belonging to a cardinal, which could repeat the Apostles' Creed, and for which a hundred golden crowns were paid; and of another which served as a chaplain to a vessel, reciting the prayers to the sailors, and afterwards repeating the rosary! Parrots live to a great age. An instance of one is recorded which had lived in captivity for ninety-three years! The green parrot, *Chrysotis Amazonicus*, has also a high character for acquiring language. It is a native of South America, and is very abundant in Guiana and Surinam. Some of the species are small birds, with the tail short, and nearly square. *Psittacula* (*Nasisterna*) *pygmæa*, is the smallest of all the family, and is a native of New Guinea. The little "love birds," so extensively petted, and so remarkable for their attachment to each other, belong to the same group, but have been separated from the genus *Psittacula* by some authors, and placed in a distinct genus under the expressive name of *Agapornis*. The sub family, *Lorinæ*, the lories, have the characters of the *Psittacinæ*, but the predominant colour of the latter is gray and green, while in the former the ground of colour is chiefly red. The collared lory, *Lorius domicella*, is much esteemed, and is considered an able imitator of the human voice. It is a native of the Moluccas. Two or three beautiful species are found in Australia, belonging to the genus *Trichoglossus*, and sometimes called "lorikeets." The chief food of these lovely birds is the nectar of flowers, and their tongue is exquisitely formed for procuring this diet. An individual of a species of this genus, *Trichoglossus hæmatodus*, has been known in captivity to apply its pointed tongue to a painted flower, and to a picture on a piece of chintz furniture. The sub-family, *Cacatuinæ*, or cockatoos, are well known birds, and very often met with as domestic pets. See CACATUINÆ and NESTOR.

Psittacula.—A genus of parrots. See PSITTACIDÆ.

Psittacus.—*The Parrot genus.* See PSITTACIDÆ.

Psittrichas.— A genus of cockatoos. See CACATUINÆ.

Psolus.—A genus of echinodermatous animals belonging to the order *Holothuriidæ*. The species are peculiar creatures, the back hard and convex, the belly flat, and they are able to raise both extremities of their body when they walk. *P. phantapus*, the snail sea cucumber, is a British species, and adheres to substances by its ventral disc so firmly that the head is often carried away from the body by the dredge when every

other fixed animal which it came in contact with has been brought up.

Psophia (ψοφεω, to make a noise).—A genus of birds belonging to the family *Ardeidæ*. The species upon which the genus is founded, *P. crepitans*, the agami or gold-breasted trumpeter, is a native of tropical America, and is of the size of a pheasant, though from having a long neck and long legs it has the appearance of being much larger. It inhabits upland forests, and is gregarious in its habits. It seldom flies, but runs swiftly. It is easily tamed, and in a domestic state its docility and attachment to man are extraordinary. As a bird, the agami is to man what a dog is amongst quadrupeds, as far as regards fondness and fidelity. It loads its master with caresses, follows him wherever he goes, and attacks his enemies with the greatest ferocity. It makes its appearance as often as its master sits down to table, and begins with driving out the dogs and cats and taking possession of the room, for it is so obstinate and bold that it never yields, and often after a tough battle can put a middle-sized dog to flight. It is said this bird may even be taught to tend a flock of sheep. It has the faculty of making a peculiar trumpeting noise, which gives the bird its name. The windpipe when it has entered the chest divides into two semicircular canals formed of membrane, and capable of extension. The air-bag on the right side descends to the pelvis, and within the breast is divided into three or four cells by transverse membranes or diaphragms. The air-bag on the left side is narrower and shorter. The sound, which is hollow, and resembles the syllables "too-too" uttered five or six times precipitately, is produced by the air pressed up from the lower air sacs meeting with the transverse membranes in its passage, and causing them to vibrate and sound. These vibrations are communicated to the surrounding muscles and by them to the external air. It lays from ten to sixteen eggs, which it deposits in a shallow place it hollows out of the ground at the foot of a tree instead of a nest.

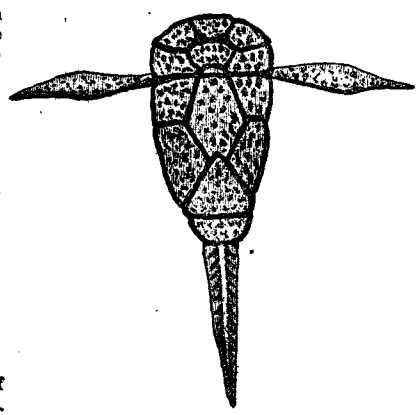
Psophodes (ψοφωδης, noisy).—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, and family *Meliphagidæ*. The only species belonging to the genus *P. crepitans*, is a native of New South Wales, and is remarkable for the peculiar cry which it emits. It resembles so closely the sharp crack of a whip, that the bird is called by the colonists "the coach-whip bird."

Psoralea (ψωραλιος, warty).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Papilionaceæ*. The species are numerous, and are either herbaceous or shrubby. The plants are covered with glands like little tubercles. They are natives of various parts of the world, chiefly within the tropics. *P. bituminosa*, however, is the only species which reaches the southern parts of Europe. It is a native of the coasts of the Mediterranean, and is remarkable for the strong odour of bitumen it possesses. *P. odoratissima* is a native of the Cape of Good Hope, and is a shrub six or seven feet high. Its bluish-white flowers are possessed of an agreeable smell, and the plant is sufficiently elegant to be cultivated as an ornament to the conservatory. *P. glandulosa* is a native of Chili, where it is called coulen or cullen, and in this country is known by the name of Paraguay tea. The natives of Chili employ it as a vermifuge and stomachic. An infusion of the roots is emetic, and the leaves are purgative. *P. esculenta* is a native of North America. It is cultivated along the banks of the Missouri, where it is called the "bread-root." The roots abound in farinaceous matter, and are employed like the potato as food in the winter months.

Psychotria.—A genus of plants. See IPECACUANHA.

Psyllidæ (ψυλλος, a flea).—A family of homopterous insects allied in habits to the *Aphidæ*, but deriving their name from their powers of leaping. They subsist entirely upon plants, and many of the species in their preparatory stages are covered with a white cottony secretion. Some species, by puncturing vegetables in order to suck the sap, occasion the production of gall-like monstrosities. Two species, *Psylla pyri* and *P. mali*, are very injurious in orchards, the former to the young leaves and shoots of the pear, and the latter to the apple.

Pterichthys (πτερυξ, a wing; ιχθος, a fish).—A fossil genus of ganoid fishes found in the old red sandstone of Scotland. Eight species have been described.



Pterichthys Millert.

Pteris (πτερον, a wing).—A genus of acotyledonous plants belonging to the nat. ord. *Filices*, and to which the common fern or bracken belongs. This plant, *P. aquilina*, is the most abundant of our British species, and in addition to this country is found also in Asia and Africa.

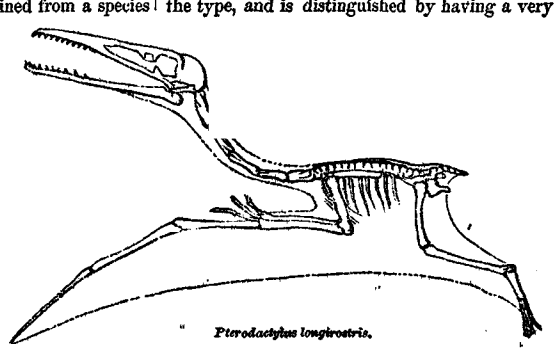
It is used in many places for manure and as a litter for cattle. The rhizome when cut across presents the appearance of a spread eagle, from which circumstance it has derived its specific name. Its ashes, when the plant is burnt, contain a great quantity of potash.

Pteronetus.—A genus of eagles. See AQUILINÆ.

Pterocarpus (πτερον, wing; καρπος, fruit).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, and containing some useful species. They are unarmed trees or shrubs, indigenous to tropical Asia. Their leaves are pinnate, and the flowers are in panicles, succeeded by an almost round, quite hard, and nearly woody legume, completely surrounded by a coriaceo-membranous wing. The chief and most important species of the genus is *P. sandalinus*, the wood of which is known by the name of red sandal wood. It is a lofty tree, a native of India and Ceylon, and the wood is sweet-scented, very hard, fine grained, heavier than water, and of a fine garnet colour which deepens on exposure to the air. The principle upon which its colour depends is called santaline. This wood is used by dyers and colour manufacturers, and is employed also to colour medicinal preparations, as the compound tincture of lavender, &c. A variety of the resin called dragon's blood, is obtained from a species of this genus. *P. draco*, the dragon's blood pterocarpus, a native of Guadaloupe, is a tree nearly thirty feet high. The wood is white and heavy, and when the stem is wounded, a resinous juice flows out, of a red colour, which concretes on exposure to the air. Formerly this resin constituted an extensive article of commerce from Carthagena, but it has now nearly ceased; the dragon's blood now in the market being obtained from *Calamus draco*. Another gum resin is the produce of a third species of pterocarpus. This substance, well known under the name of gum kino, is obtained from an African tree, *P. erinaceus*. The tree is forty or fifty feet high, grows in Senegal, and the gum is much esteemed as a powerful remedy in obstinate chronic diarrhœas and dysenteries.

Pteroceras (πτερον, a wing; κερας, a horn).—A genus of molluscous animals belonging to the class *Gasteropoda*, and family *Strombidæ*. The shells of this genus differ from the rest of the strombs by the right lip being dilated into a digitated wing, and having a sinus near its base. They are oval-oblong, swollen, and terminated inferiorly by an elongate canal. Many of the species are of a large size, and all of them inhabit the seas of warm climates. Their digitated outer lip often gives them a bizarre form, which is indicated by their specific names—one being called the scorpion, another the millipede, a third the spider, &c.

Pterodactylus (πτερον, wing; δακτυλος, finger).—A genus of extinct fossil reptiles belonging to the order *Saura*, and forming the type of a group called *Pterosaura*. The species are found in the oolite, the schists of Solenhofen, and in the lias. At one time the curious creatures forming this genus were referred to the class *Mammalia* and order *Cheiroptera* or bats, and at another to the class of birds. They are now, however, distinctly recognized as reptiles. One of the most characteristic marks of the genus is the extreme length of the fifth finger of the anterior extremity, and which demonstrates the fact that the animal had these extremities covered by an extended membrane, forming a wing equal in power and extent to that of the bats. The other fingers being short and provided with hooked claws show that the creatures were in the habit of suspending themselves from trees or rocks. The large eyes prove that they were nocturnal. The head and neck are long and bird-like, the trunk and tail short, and the teeth smooth, sharp, and of some length. About twenty different species have been described. *P. longirostris* is the type, and is distinguished by having a very long neck and muzzle. It was about the size of a woodcock. It is believed by some palæontologists that this animal could swim in the water as well as fly in the air.



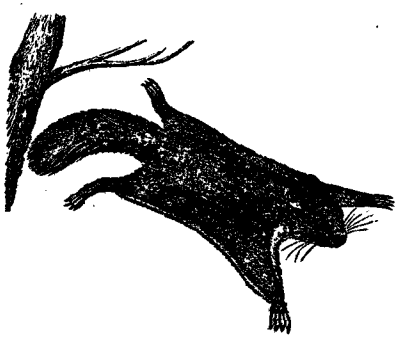
Pterodactylus longirostris.

Pterodina.—A genus of minute animals belonging to the class *Rotifera*, and family *Brachionæa*. They are distinguished by having two eyes in front, a round or oval carapace like a slender scale, within which the animal withdraws its body completely. Their rotatory apparatus consists of two rounded lobes extending beyond the edges of the carapace. Their tail is ridged transversely, placed upon the extremity of the middle part of the body and furnished with vibratile cilia.

Pteroglossus (πτερον, a wing; γλωσσα,

tongue). *The Aracari.*—A genus of toucans. See RAMPHASTIDÆ.

Pteromys (πτέρον, wing; μυς, rat). *The Flying Squirrel.*—A genus of rodent animals belonging to the order *Glires*, and family *Sciuridæ*. The squirrels may be divided into two groups, those with free limbs and those with their limbs invested in the skin of the sides. To the latter group belong the genera *Pteromys* and *Sciuropterus*. The species belonging to these two genera are small animals, with teeth similar to those of the true squirrels, and the tail flattened and distichous. They have the skin of the flanks very much dilated, and extended between the front and hind legs in such a way as to give the appearance of a parachute, which enables them to bound



Pteromys petaurista—Flying Squirrel.

through the air to a great distance like the bats. This expansion is not, however, naked and membranous as in these animals, but covered with fur like the rest of the skin. The taguan, *Pteromys petaurista*, is the largest species, measuring about one and a-half foot long, exclusive of the tail, which is about twenty inches more. It is a native of India, the Moluccas, and Philippiné Islands. The upper part of the body is brown dotted with white, and the under part is gray, while the tail is nearly black. The natives eat its flesh and reckon it good. Two or three other species inhabit Nepâl. The polatouche, *P.* (*Sciuropterus*) *volans*, or European flying squirrel, is a small species about four and a-half inches long, exclusive of the tail, which is somewhat longer than the body. It is found in the extensive pine forests of the north of Europe, particularly in Finland, Lapland, Livonia, Lithuania, and Siberia. The membranes extend to the base of the fore feet, the tail is full and rounded at the extremity, and its colour is of an ashy-gray above and pure white beneath. It is a solitary animal, wandering about even during winter, and takes up its abode in the hollows of trees, forming a nest of the moss from the birch. It feeds upon the buds and fruit of the birch trees and on the cones of the fir tribe. The assapan, *P.* (*Sciuropterus*) *volucella*, is a pretty little creature, rather smaller than the preceding, and of a reddish-gray above and white beneath. It is a native of Canada and the United States, is very timid, and of nocturnal habits, sleeping during the day in a nest of dried grass or leaves disposed at the bottom of a hole in some tree. As soon as evening sets in, it becomes all alive and active, and by means of the extended membrane of its body, is able to leap from tree to tree forty or fifty paces distant from each other. It is a gregarious animal, living in small troops upon trees from which it rarely descends, and feeds upon seeds, the buds of pine trees, &c.

Pteronarcys.—A genus of insects belonging to the order *Neuroptera*, and family *Perlidæ*. One of the most interesting species is *P. regalis*, a native of Canada and other more northern parts of North America. During the day these insects shun the light, conceal themselves under stones in damp places, and appear on the wing at nightfall, when the air is charged with moisture. The most remarkable fact connected with this species is the discovery of persistent branchiæ in the perfect insect. The larva lives in water where these branchiæ are absolutely necessary, but instead of losing them, as other insects of that kind do when they assume the perfect state, they retain them throughout their whole life.

Pterophorus.—A genus of insects. See ALUCITIDÆ.

Pteropleura.—A genus of saurian reptiles. See GECKOTIDÆ.

Pteropoda (πτέρον, a wing; πους, a foot).—A class of *Mollusca*, consisting of animals whose entire life is passed in the open sea, and which are found swimming on the surface by means of two anterior expansions, like wings. They swarm in the tropics as well as in the arctic seas, where they actually discolour the water by their amazing numbers. In high latitudes they form the principal food of the whale. They are either naked or without an enveloping shell—as CLIO; possess a thin horny or cartilaginous covering very much resembling a slipper—as CYMBULIA; or have a beautifully transparent, glassy, symmetrical shell, of a globular form, like HYALÆA, or straight, like CLEODORA. Their shells are rarely drifted on shore, but abound in the fine sediment brought up by the dredge from great depths. A few species occur fossil in the tertiary strata of England, but in the older rocks they appear unknown.

Pteropus (πτέρον, a wing; πους, a foot). *The Roussettes.*—A genus of animals belonging to the class *Mammalia*, order *Cheiroptera*, and family *Vespertilionidæ*. It forms the type of the sub-family *Pteropinæ*. The animals belonging to this group are frugivorous for the most part, are of quiet habits, live in large flocks, and during the daytime suspend themselves by their hind feet to trees, rocks, or old buildings. At twilight, however, they take wing, and commit great depredations amongst the orchards.

They are all natives of the warm parts of the Old World and the Australian islands, where they are called flying foxes. The kalong, or edible roussette, *P. edulis*, is the largest species, varying from eleven to fifteen inches in length, and from three to five feet in extent. It is abundant in Java, and uniformly lives in society. Numbers of individuals are to be found suspended by the claws of their hind legs to the extended branches of a species of fig tree. They commit immense destruction to gardens and orchards, but are on the other hand themselves much valued as food by the natives, their flesh being white, delicate, and tender. Many other species are known and described.

Ptilonogonys.—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, and family *Ampelidæ*. The best known species is a bird found in the West Indies, *P. armillatus*, and known in Jamaica by the name of solitare and the bishop. It is described by those who have heard it as possessing, at particular times, a remarkably melodious song, equal, if not superior, to that of the nightingale. When several birds are singing together, their notes are heard sweet and lengthened like those of the harmonica or musical glasses.

Ptilonorhynchus.—A genus of birds belonging to the conirostral tribe of the order *Passeres*, family *Sturnidæ*, and forming the type of the sub-family *Ptilonorhynchinæ*. To this genus belongs the satin bower bird of Australia, *P. holosericeus*. The bird in question has long been known, but its peculiar habits have only lately been pointed out. One of these is alluded to in its English name, that of forming a bower-like structure for the purpose of a playing ground or hall of assembly. This is usually placed under the shelter of the branches of some overhanging tree in the most retired part of the forest, and is a really curious structure. The base consists of an extensive and rather convex platform of sticks finely interwoven, on the centre of which the bower itself is built. This, like the platform on which it is placed, and with which it is interwoven, is formed of sticks and twigs, but of a more flexible and slender description, the tips of the twigs being so arranged as to curve inwards and nearly meet at the top. In the interior of the bower the materials are so placed that the forks of the twigs are always presented outwards, by which arrangement not the slightest obstruction is offered to the passage of the birds. These bowers or runs are not used as nests, but apparently as playing grounds at the pairing time and during incubation. At these times many individuals of both sexes assemble there, run through and around the bower in a sportive and playful manner, and that so frequently, that it is seldom deserted. The spotted bower bird, *Chlamydera maculata*, prepares a similar bower, but more elaborately constructed and adorned. Bivalve shells, crania, and other bones of small mammalia, bleached white, and coloured feathers of birds, form the decorations to the entrances, while the inside is lined with grasses and small round pebble stones.

Ptiloris.—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, and family *Upupidæ*. The species upon which the genus is founded, *P. paradiseus*, the rifle bird, is said to be the most gorgeously plumaged bird in Australia. The general colour of the male is a rich velvety-black, the feathers of the abdomen and flanks being broadly margined with rich olive-green. The feathers of the head and throat are small, scale-like, and, as well as the two centre tail feathers, of a shining metallic blue-green.

Ptinus.—A genus of small *Coleoptera*, the species of which, especially *P. fur*, frequent houses and granaries. The larvæ devour dried plants and the prepared dry skins of animals.

Ptychoceras (πτυξ? a fold; κερας, horn).—A fossil genus of cephalopodous *Mollusca*. See AMMONITIDÆ.

Puccinia.—A genus of coniomycetous *Fungi*, containing those minute forms known by the name of rust and mildew. See THALLOGENÆ.

Puffinus. *The Shearwater.*—A genus of birds belonging to the order *Anseres*, and family *Procellaridæ*. They are characterized by having a slender bill, fully as long as the head, with the mandibles compressed and curved at the tip. The wings are long and pointed, and the legs of moderate length. One of the species, *P. Anglorum*, is a native of Great Britain, where it is known by the name of the manx petrel or shearwater. It lives for the most part out at sea, and only seeks the shore for the purpose of incubation. It breeds on the Isle of Man, in rabbit holes; in the Scilly Islands, and several places on the coast of Scotland and Wales. It arrives at its breeding stations in March, and generally leaves in August. The young are fat, and sought after by the natives, who salt and eat them. An allied species called the "petrel puffin" is known to the inhabitants of the Levant. It occurs in considerable abundance in the "Canal of Constantinople," and numbers of them are seen passing and re-passing, and skimming the surface of the water with great rapidity. The constant agitation and sort of inquietude which appears to torment them in flying from the Black Sea to the Mediterranean, and back from the Mediterranean to the Black Sea, has made the people compare them to infernal spirits, and caused them to give them the name of "Ames damnées."

Pulex.—Pulicidæ.—The flea genus and family. See APHANIPTERA.

Pulmograda (*pulmo*, the lung; *gradior*, to walk.)—An order of the class *Acalephæ*. See ACALEPHÆ.

Pulmonaria (*pulmo*, the lung). *Lungwort.*—A genus of dicotyledonous plants belong-

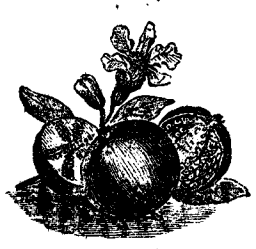
ing to the nat. ord. *Boraginaceæ*. The radical leaves of *P. officinalis*, being marked with light coloured spots, has suggested a resemblance to those which occur in some diseased states of the human lung. Amongst the earlier botanists accordingly, who judged of the medicinal virtues of plants from their fancied resemblances, this plant was held in high repute in consumption and other diseases of the lungs. The whole plant abounds in nitre and has a mucilaginous taste. In the north of Europe it is used as a pot-herb.

Pulmonifera = Pulmonata.—An order of molluscous animals belonging to the class *Gasteropoda*. It derives its name from the animals which belong to it respiring free air, which is received into a cavity between the mantle and the back, lined internally with numerous reticulated vessels, like the lungs of quadrupeds and birds. This order contains the land snails, *Helicidæ*, which are entirely terrestrial in their habits; the pond snails, *Lymnæidæ*, and *Auriculidæ*, which inhabit fresh water ponds, &c., but which come to the surface to breathe; and several marine genera, as *Siphonaria*, &c. They have also been called *Pneumonobranchiata*.

Puma.—The American lion. See FELINÆ.

Pumice (*Ponce* of the French).—A vesicular species of lava composed chiefly of felspar, of a gray or white colour, fragile, rough to the touch, and scratching glass. It is so light as to float on water. Pumice is used in commerce for various purposes, especially for polishing wood, ivory, and metals.

Punica.—A genus of dicotyledonous plants belonging to the nat. ord. *Myrtaceæ*. The only species is a tree, which is well known as the pomegranate, and the fruit of which is esteemed as exceedingly pleasant and grateful to the taste.



Pomegranate.

This tree grows in India, Syria, Persia, and the north of Africa. Its dark green shining foliage, conspicuous dark scarlet flowers, and its large red coloured fruit, have made it an object of admiration in hot climates. It is the "rimmon" or pomegranate mentioned in Scripture, and the juice of which is alluded to as a beverage in Solomon's Song, chap. viii., ver. 2. At the present day it is still very much employed in the manufacture of a kind of sherbet in frequent use amongst Orientals. The rind of the fruit and the bark of the root are very astringent, and are considered exceedingly efficacious as anthelmintics, more especially in expelling tapeworm.

Pupa.—In Entomology this term is applied to that stage of existence of an insect which succeeds the larva or caterpillar. See CHRYSALIS. In Conchology it is employed to designate a genus of land shells which in general form resembles the pupa of an insect.

Pupina.—A genus of gasteropodous *Mollusca* belonging to the operculated *Pulmonifera*. It contains several species remarkable for their extreme smoothness and highly polished appearance. They are small, of a sub-cylindrical form, with a circular mouth, the peristome thickened and notched in front. The operculum is membranous and narrow whirled. The natives of New Guinea employ *P. Keraudrenii* as an ornament, stringing them as pearls.

Pupipara.—A section of insects belonging to the order *Diptera*, and composed of parasitic species of a very peculiar structure. They are arranged in two families. See HIPPOBOSCIDÆ and NYCTERIBIA.

Pupivora = Entomophaga (*pupa*; *devoro*, to devour; *ἐντομον*, insect; *φαγω*, to eat).—A section of hymenopterous insects, so called because the larvæ feed for the most part upon the pupæ and larvæ of other insects. They contain several families and numerous genera. See ICHNEUMONIDÆ, CYNIPIDÆ, CHRYSIDIDÆ, CHALCIDIDÆ, and PROCTOTRUPIDÆ.

Purpura.—A genus of marine pectinibranchiate gasteropodous *Mollusca*, belonging to the family *Buccinidæ*. The chief character of the shell is to have the columella flattened in front, and the aperture large and slightly notched. The recent species are numerous, about 140 having been described. The animals of many of them possess a fluid of a purple or violet colour, which may be obtained by pressing upon the operculum. This secretion has given rise to the name of the genus, as it was at one time supposed that it was from some of the species of this genus that the celebrated Tyrian purple dye was obtained. It is now, however, considered more probable that this dye was procured from *Murex Brandaris*, or some allied species. The common species, *P. lapillus*, abounds on the British coast at low water amongst sea-weed, and is said to be very destructive to mussel beds. Some writers assume this species to have been the one from which the purple dye was obtained, but this shell does not appear to be a native of the Mediterranean. The most typical species of the genus is *P. persica*, a fine large shell found in India. Several species, about thirty in number, are found fossil in the most recent of the tertiary beds.

Pustulipora (*pustula*, a pustule; *porus*, a pore).—A genus of fossil corals found in the crag.

Putorius. *The Polecat.*—See MUSTELIDÆ.

Puya.—A genus of plants. See BROMELIACEÆ.

Puzzuolite or **Puzzuolane** (from *Pouzzol*, town in Naples).—A name given to volcanic ashes which have become decomposed, and consisting of silica, alumina, lime, magnesia, potash, soda, oxide of iron and titanium, and water. It is much used in mixing with mortar to produce hydraulic cement. It is found in large quantities at Pouzzol near Naples, and has long been worked there.

Pycnogonidæ. *Sea Spiders.*—An order of animals belonging to the sessile-eyed *Crustacea*, but till lately arranged amongst the spiders. They have no branchiæ, but appear to breathe through the skin, the aeration of the blood being effected by the mere contact of the water, in which they live, with the external surface of the body. They have a crustaceous slender body of five joints, not much thicker than the limbs, which are four pairs in number, and generally very long. The females have a supplementary pair, much smaller than the others, bent under them, and destined to support the eggs. The sea-spiders, as their name imports, are all marine, and they are of small size. They conceal themselves amongst the sea-weeds and corallines between tide-marks, and under stones within the lowest tide-line, and occasionally they are dredged from deep water. Their motions are remarkably slow, and they probably live on dead animal matter or small marine insects. The females are apparently fewer in numbers than the males, or at least are much more seldom met with, and may be readily distinguished by the supplemental pair of legs mentioned above, as destined to hold and carry the eggs. These are collected into globular masses enveloped with a thin skin or membrane, each mass firmly adherent to the oviferous leg, and consisting of a congeries of numerous round ova. The young are softer and longer bodied, proportionally, than the adult, and appear to undergo considerable changes in their progress to maturity. The *Pycnogonidæ* are divided into several genera. *Nymphon* is distinguished by having very long and slender legs; in one species, *N. gracile*, being four times the length of the body. *Pycnogonum* has short and stout legs, only about the length of the body. One species, *P. littorale*, is said to live parasitic upon whales and certain fishes, but in this country is always found under stones and amongst sea-weeds at low water mark.

Pycnogonum (πυκνος, thick; γονυ, a knee).—See PYCNOGONIDÆ.

Pycnotinæ.—A sub-family of thrushes. See TURDIDÆ.

Pygathrix (πυγη, buttocks; θριξ, hair).—A genus of monkeys, containing the douc of Cochin-China. See SIMIIDÆ.

Pyralidæ.—A family of insects belonging to the order *Lepidoptera*, section *Heterocera*. This family consists of small moths, many of the species of which fly during the day, even in sunshine. The genus *Pyralis* is the type of the family, one of the species of which deserves notice from its larva being often found destroying cabbages and the horse radish. This little moth, *Pyralis forficalis*, has two broods in the year, the first in May, the second in August. It is known by the name of the cabbage-garden pebble moth, and the caterpillars are sometimes sufficiently numerous to do important damage.

Pyrethrum (πυρεσσω, to set on fire).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, consisting of a number of species scattered over all the temperate parts of the Old World. They are herbaceous plants, rarely shrubs, with heads of flowers, solitary, or grouped into corymbs, with a yellow disc and white rays. *P. parthenium*, or feverfew, is common in Britain and many other parts of Europe. It exhales a strong aromatic odour, and has a warm bitter taste. It was at one time a favourite remedy for the cure of ague—hence its English name. It possesses tonic properties, and was long used in hysterical complaints. The smell of this plant is said to be peculiarly disagreeable to bees, so that a quantity of the flower heads, carried in the hand, will easily keep these insects at a distance. *P. officinale*, or pellitory of Spain, is a native of the East, and its root possesses such hot stimulating properties, especially when chewed, as to give the name to the genus. It produces the sensation upon the lips of a flame of coal, and is in consequence well known and much used as a sialagogue, and in cases of toothache. It contains a volatile acrid oil, which is said to be serviceable in cases of palsy, and has been used as an epispastic, when it is washed, to produce irritation of the skin. It is the *Anacyclus Parthenium* of many botanists.

Pyrgita.—The generic name of the house sparrow. See FRINGILLIDÆ.

Pyrgoma.—A genus of cirripeds. See BALANIDÆ.

Pyrgopus.—A genus of reptiles. See BIPES.

Pyrites (πυρ, fire).—An ore of iron. See FERRUM.

Pyrola.—The winter green. See PYROLACEÆ.

Pyrolaceæ.—A nat. ord. of dicotyledonous plants, containing a number of species which are herbaceous, rarely shrubby, and natives of the temperate and cool parts of the northern hemisphere, more especially of America. The genus *Pyrola* is the type, composed of a variety of herbs found growing in the wooded hilly parts of Europe, Asia, and North America. They are pretty plants, with simple oval-elliptic or rounded leaves, coriaceous and dentated. The flowers are bell-shaped, and form in general a terminal unilateral raceme. Several species are natives of England and Scotland, and it has been observed of one of the commonest species, *P. minor*, the lesser winter green, that it springs up spontaneously in the fir plantations of the latter country,

as soon as the heaths and small carices disappear under the hurtful shade of these trees. It is thought by some botanists that the seeds of the plants must have remained dormant in the soil ever since the ante-Roman period, when the country was covered with forest. They were the fair flowers, says Dr. Johnston, that were wede away with the destruction and abolition of the shelter and shade that fostered their growth; and that shade being restored, they again revive and occupy their ancient haunts. The family forms only a tribe of the nat. ord. *Ericaceæ* according to many botanists.

Pyrophorus (*πυρ*, fire; *φερω*, to carry).—A genus of fireflies. See ELATERIDÆ.

Pyrosoma (*πυρ*, fire; *σωμα*, body).—A genus of molluscous animals belonging to the class *Tunicata*, and family *Pyrosomidæ*. The species are compound aggregate animals, gelatinous, nearly diaphanous, forming a hollow cylinder, closed at one extremity, truncated and open at the other, and roughened all over externally with a multitude of tubercles, disposed either irregularly, or in rings. They are natives of the seas of warm climates, and as their name imports, they are highly phosphorescent during the night, shining in the water like globes of liquid fire. See TUNICATA.

Pyroxene.—A mineral substance. See AUGITE.

Pyrrhocorax (*πυρ*, red like fire; *κοραξ*, crow).—A genus of birds belonging to the conirostral tribe of the order *Passeres*, and family *Corvidæ*. It forms the type of a small sub-family, *Pyrrhocoracinæ*, and derives its name from the red colour of its feet. The beak is of moderate size, rather slender, and slightly arched from above in all its length; the nostrils are round and concealed by the feathers of the forehead, which are directed forwards; the feet are strong, the claws large, arched, and very sharp, and the wings are large and pointed. The typical species *P. alpinus* (*Corvus pyrrhocorax*) is of an intense black, with a yellow citron beak, and when full grown, red legs. Inhabiting the Alps, this bird is found in flocks during the whole summer, living on the summits of rocks, and building their nests in the crevices. They feed chiefly on berries, alpine seeds, small molluscs, and insects, especially the beetle called *Chrysomela gloriosa*, though they do not despise carrion. In winter they descend into the plains, and emigrate into the neighbouring countries. They are wild, fierce birds, though the pretty red-winged tichodrome, and the wall creeper, appear to enjoy their society, creeping up the face of the rocks, while they themselves are sitting perched on the peaks.

Pyrrhula. See PYRRHULINÆ.

Pyrrhulinæ.—A sub-family of birds belonging to the conirostral tribe of the order *Passeres*, and forming part of the family *Fringillidæ*. The genus *Pyrrhula* is the type of the family, and the best known species belonging to the genus is the common bullfinch, *P. vulgaris*. This bird is about the size of a sparrow. The bill is strong, short, black, and thick; the upper part of the head, the ring round the bill, and the origin of the neck, fine glossy black; the back, ash-gray; breast and belly, red; wings and tail, black; upper tail coverts, and vent, are white; and the legs dark brown. It is a common bird in Great Britain, as well as in most parts of Europe, living in woods and thickets, orchards and gardens, and feeding upon insects and tender buds. The song of the bullfinch is of a modest softness and sweetness, but murmured in such an under tone as to require a close proximity to the bush whence it proceeds to make the ear aware of it. Its docility in learning to whistle tunes in captivity is well known, and in Germany, where it is very common, there are regular schools for teaching them. Our piping bullfinches are imported from that country. The genus *Carpadacus* contains one or two interesting species. The crimson-throated finch, *C. frontalis*, is one of these. It is a native of Central America, and is found very abundant at Santa Fé. During the season of incubation, the song of the male is very beautiful; at one time recalling the soft trill of the house wren, and at another the clear warble of the canary. They are social birds, building their nests about the eaves and porticos of houses in great numbers. They appear to have two or three broods in the year.

Pyrula (*pyrus*, a pear).—A genus of gasteropodous *Mollusca* belonging, according to many conchologists, to the family *Muricidæ*. The shell is pear-shaped, with a short spire, a thin outer lip, a smooth columella, and a long open canal. They have no operculum. As originally established by Lamarck, the genus *Pyrula* contained a considerable number of species, but of late they have been separated into several genera.

Pyrus. *The Apple* and *Pear genus*.—See POMACEÆ.

Python.—A genus of serpents. See BOIDÆ.

Pyxis.—A genus of reptiles belonging to the order *Chelonia*, and family *Testudinidæ*, or land tortoises. The genus pyxis is the only land box-tortoise, and is characterized by having the thorax solid, and the sternum with the front lobe moveable. This portion of the carapace is small, but by means of its forming a sort of moveable door or lid, the animal can, by lowering it at will, protrude its head and fore feet, and by raising it, shut itself up in a sort of box. Only one species is known, *P. arachnoides*, a native of Madagascar and the Isle of France.

Quadrumana (*quatuor*, four; *manus*, hands). —An order of animals belonging to the class *Mammalia*, according to Cuvier, and established by him to receive the animals known under the name of monkeys and lemurs. They are characterized by the following marks:—their limbs are all adapted better for prehension than walking; the hind, as well as their fore legs, having hands possessing long extensile fingers, terminating in regular nails and opposable thumbs. The species in general are fitted for climbing and living upon trees, and their movements, in such situations, are very nimble, whilst on the ground they are awkward, and, comparatively speaking, slow. They are for the most part natives of intertropical climates, living nearly under the same latitudes in America, Africa, India, and the large islands in the Indian Ocean. Their food consists chiefly of fruits of all kinds, and it is in situations where fruits most abound that they are found in greatest numbers. Some of the species approach man in their general conformation, whilst others are but little removed from ordinary mammalia. The greater number live in society, congregating together in large troops—see SIMIIDÆ, CEBIDÆ, LEMURIDÆ, &c. The remains of quadrumanous animals in a fossil state are rarely to be found. Two species only have been discovered in Europe; one existing in a tertiary deposit in the department of Gers in France, and another in Suffolk in England, in the London clay. Portions of two or three others have been found lately in India and South America.

Quadrupeda (*quatuor*, four; *pes*, foot). *Quadrupeds.*—A general term for four-footed viviparous animals belonging to the class *Mammalia*, and nearly analogous to that term.

Quamoclit. — A genus of dicotyledonous plants belonging to the nat. ord. *Convolvulaceæ*. The species are climbers, with alternate cordate leaves, and red flowers. *Q. vulgaris* is the most common, occurring in every part of India, and from its beauty now cultivated in this country. It resembles the kidney bean in its habit, though much smaller, and derives its generic name from this circumstance, *quamoclit* signifying a "dwarf bean."

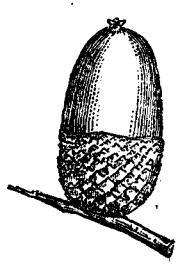
Quartz. — A mineral substance composed chiefly of silica, and entering into the composition of a number of rocks, such as granite, mica schist, &c. Quartz is one of the most abundant and common of all kinds of minerals, plays an important part in the structure of the surface of the globe, and is a most useful substance for a number of purposes. It is found in all parts of the world, at all depths in the earth, and in almost all formations. It is hard enough to scratch glass, is infusible by the blowpipe, except when mixed with carbonate of soda, is insoluble in water, and only soluble in hydrofluoric acid. The varieties of quartz are very numerous. *Hyaline Quartz* is often transparent like glass, and then it is known by the name of *Rock Crystal*. When pure, rock crystal is perfectly limpid and uncoloured. It is often, however, mixed with other substances, which impart a variety of colours to it. *Smoky Quartz* constitutes the crystals called *Cairngorum*. When it is of a violet colour, it constitutes the *Amethyst*; when yellow, it is known by the name of *False Topaz*; and when of a rose colour, it forms what is called the *Bohemian Ruby*. These varieties are generally found in the form of crystals, and they sometimes attain a considerable size, some having been found eighteen to twenty inches in length. They are found in Madagascar, Siberia, &c. Rock crystal was formerly very much esteemed as an object of luxury. From it were made lustres, boxes, large plates for engraving figures, &c. At present, however, artificial crystal is so much manufactured, that the real rock crystal is little used. Other varieties are *Nectic Quartz*, or float stone, a vesicular form which floats on water; blue quartz, or *Siderite*; green quartz, or *Chrysoprase*; red quartz, or *Compostella*, &c. The valuable stone called the *Cat's-eye* is quartz penetrated by filaments of asbestos. When polished and rounded, this stone presents nacreous reflections of a whitish colour, which appear to float in the interior of the mass, so as to seem to move. AVENTURINE is a brownish-red variety, a colour which it owes to the presence of spangles of mica. Other varieties are AGATE, JASPER, OPAL, &c. *Fibrous Quartz*, often called *Siliceous Wood*, is a variety where silica, probably in solution, has replaced the woody texture of trees. It is found in the West Indies, Burmah, Van Diemen's Land, Kerguelen's Land, Loch Neagh in Ireland, &c. Most of the above mentioned varieties of quartz are only found as it were accidentally, and not in large masses; but whole rocks are sometimes composed of this mineral, such as *Granular Quartz*, *Quartzite*, &c. *Arenaceous Quartz* occurs in small grains, free, or aggregated with each other, and often forming large deposits. It is this kind which mainly constitutes the sand of the sea shore, and the arid plains of Northern Europe and Asia, which are known by the names of llandes and steppes, as well as the vast deserts of Africa, are chiefly composed of it. Quartz is used in the arts and manufactures. In the manufacture of glass the quartz sand above mentioned is extensively employed, fusing it with an alkali, and cements and mortars are also made of it mixed with quicklime.

Quassia (named after *Quassy*, a negro, who first made known the medicinal virtues of one of

the species).—A genus of dicotyledonous plants belonging to the nat. ord. *Simarubaceæ*. The species are trees, and are natives of the tropical parts of South America. The genus is now divided into three. One of the principal species is *Quassia amara*, a tall shrub, fourteen or fifteen feet high, with remarkable pinnate leaves, and winged petioles, and large scarlet flowers. It is a native of Surinam, Guiana, and Colombia, and used formerly to furnish the wood so well known as quassia wood. The quassia of the shops at the present day, however, is the wood of *Q.* (*Picræna*) *excelsa*, a very large forest tree, attaining a height of nearly 100 feet, growing in Jamaica and other West Indian islands, where it is called bitter ash and bitter wood. Few substances belonging to the vegetable kingdom possess a pure bitter principle to such an intense degree as quassia does. This depends upon the presence of a crystalline principle called *quassite*, or *quassine*. The bark of the tree and the wood itself are the parts which contain it. Quassia is employed as a tonic and febrifuge, and was at one time much esteemed as a cure for the malignant endemic fevers of Surinam. An infusion of the wood acts as a narcotic poison on flies and other insects, and has frequently been employed as an anthelmintic. It is frequently used by fraudulent brewers as a substitute for hops, and has been prohibited by law to be so employed. The bark known by the name of simarouba bark is the produce of another species, *Q. simaruba* (*Simaruba amara*). This species is a large tree, grows in the West Indian islands, and is used as a bitter tonic and astringent, more especially in the advanced stages of diarrhœa and dysentery.

Quercitron.—The bark of a species of oak. See QUERCUS.

Quercus. *The Oak.*—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, and sub-order *Cupuliferæ* or *Corylaceæ*. The species are numerous, and are found growing in all the temperate climates of the northern hemisphere. In the southern hemisphere they are unknown, their limits in that direction being the islands of the Indian archipelago. Oaks extend over all Europe, as far as the 56° of north latitude. They are found in Asia Minor, upon Atlas, and the Caucasus; in China and Japan; upon the slopes and in the valleys of the Himalaya mountains; in the United States of America, not extending, however, beyond 45° north; and in Mexico and the Cordilleras, at an elevation of 9,000 feet. The oak appears from the earliest times to have composed the greater part of the vast forests of Europe; and in France at the present day, the greater part of their woods, consisting of four millions of *hectares*, is composed of two or three species of this genus. From time immemorial the oak has been the source of much veneration with the primitive people of Europe, from the shores of the Baltic to the coasts of the Mediterranean. The Greeks invested its history with poetic fables. According to them the Hamadryads lived *under* the bark of the tree, and their life was intimately connected with that of the tree itself. The Dryads lived also *within* the oak, but they could quit their residence at pleasure. The Greeks betook themselves to the profound depths of the forests of Dodora, in Epirus, to consult and receive the oracles uttered by the sacred oaks; and branches of this tree, dedicated to Jupiter, formed the crown which rewarded the conqueror in the Olympic games. The Romans made a crown of oak leaves the reward of civic virtues. The Teutonic nations celebrated the religious rites of Odin in the bosom of their oak forests; and this tree, with its parasitic misleto, performed an important part in the worship of the Druids. With the advance of time and civilization, the superstitious virtues attributed to the oak have disappeared; but its real merits remain, to stamp it as one of the most useful trees man possesses. The wood is one of the hardest and most enduring of all, and is employed in all works requiring such qualities. From the commonest purpose to the construction of our largest line-of-battle ships, the oak is preferred to almost all; and the wood found in bogs, &c., and rendered black as ebony, is used by carvers and decorators for church screens and cathedrals. The quantity of oak timber used in Europe is immense. It is stated that 2,000 well grown oaks, equal to 3,000 loads of timber, are required to build a seventy-four gun ship. It is much used on the continent for firewood, and is said to attain its maximum power of giving out heat after it has reached the age of forty years. The charcoal of oak is, of all the kinds made, that which is the densest. The bark contains much tannin, and is used as an astringent, and for tanning skins and leather. For this purpose it is preferred to all other substances, and the bark of trees of from twelve to fifteen years old is esteemed the best. Considerable quantities are imported into



Acorn of the Oak.

this country; and in 1842, 639,429 cwt. of oak bark were entered for consumption, the duty upon which amounted to £13,400. The acorns are extremely useful for fattening pigs. In the

early ages they formed a part of the food of man, and are still used in some countries, in times of scarcity, as a substitute for bread. When roasted, with the addition of a little butter, they are said to form one of the best substitutes for coffee. The British oak, "the unwedgeable and gnarled oak," is the most valuable species for ship-building, being superior to all others for at once supporting a weight, resisting a strain, and not splintering by a cannon shot. The best time for cutting it is when the tree has attained the age of from fifty to seventy years. A fine full grown oak is one of the most picturesque of trees, conveying to the mind associations of strength and duration which are very impressive. There are two species, however, indigenous to Great Britain, both of which are noble trees, and of nearly equal value. *Q. pedunculata* or *robur* is the English oak, and is the most abundant in this country. *Q. sessiliflora*, the sessile-cupped oak, is the more common of the two in North Wales. They differ from each other chiefly in the one having the acorns arranged in long-stalked spikes, while the other, as its name imports, has them sessile, or on very short-stalked spikes. The roof of Westminster Hall is constructed of this species, *sessiliflora*, and it is found to be the timber of some of the most ancient buildings of this country. In the wood of *pedunculata* there are numerous medullary rays, while in that of *sessiliflora* there are scarcely any visible. Some species of oak trees are evergreen, such as *Q. Ilex*, a species common in the south of Europe; *Q. Ballota*, the acorns of which are edible, and said to be as good as the chestnut. The cork tree, *Q. Suber*, is also evergreen. This is a

Quercus robur—The Oak. (Sir Philip Sidney's Oak at Penshurst.)

native principally of Spain, forming large forests in Catalonia and Valencia. The well known substance called cork is the produce of this tree. It is a thick, spongy crust, formed on the bark by the development of the cellular tissue, and is periodically shed by the tree. The chief supply of this substance, however, is obtained by artificially removing it, which may be done without the slightest injury to the tree. This is done when it has arrived at the age of from twenty-six to thirty years, and the operation may be subsequently repeated once every eight or ten years. The quality of the cork improves with the age of the tree; and trees that are regularly stripped are said to live for 150 years and more. The quantity of cork entered for home consumption in Great Britain amounts, at an average, to from 40,000 to 45,000 cwt. annually. Several good dyes are procured from species of oaks. The velani, or velonia of commerce, is procured from *Q. ægilops*, the valonia oak, a native of the Morea and adjacent countries. The acorns are the parts which yield the dye. Nearly 150,000 cwt. are imported yearly for the use of tanners, and sold at from £12 to £15 a ton. Quercitron is the bark of *Q. tinctoria*, and yields a yellow dye, which is used for dyeing wool, silk, skins, &c. It is imported from the United States, of

which the tree is a native. Kermes, a substance very much used, before the introduction of cochineal, for dyeing scarlet, is an insect which lives as a parasite upon the dwarf oak, called *Q. coccifera*. It is a species of *Coccus*. See this word. The gall-nut of commerce is the produce of *Q. infectoria*, the Oriental gall-oak, a small species, growing in Asia Minor. These gall-nuts are produced by the puncture of a small insect, *Cynips* (*Diplolepis*) *gallæ-tinctorium*. The branches of this little oak occasionally produce large, brownish-red tubercles, spongy within, which are by some supposed to be the apples of the Dead Sea, which tempt the eye, "but turn to ashes on the lips."

Querquedula. *The Teal.*—A species of duck. See ANATINÆ.

Querula.—A genus of birds. See QUERULINÆ.

Querulinæ.—A sub-family of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Ampelidæ*. The species contained in it have the bill strong, broad, much cleft, and hooked at the point. The commissure of the mouth is furnished with stiff bristles, and the nostrils are partly covered with the feathers of the forehead. The typical genus of this family is *Querula*, the species of which are insectivorous, and live in troops in the woods of America.

Quincite.—A mineral substance in the shape of light, carmine-red flocks, interspersed through a limestone deposit at Mohun, France. It is composed of silica, magnesia, oxide of iron, and water. It is believed to be only a variety of the mineral known as meerschaum.

Quinine.—The bitter principle extracted from cinchona bark. See CINCHONA.

Quinquina.—A synonym of CINCHONA. The name cinchona is derived from that of the Countess of Cinchon, the wife of one of the viceroys of Peru, in the beginning of the seventeenth century.

Quiscalus.—A genus of birds belonging to the conirostral tribe of the order *Passeres*, family *Sturnidæ*, and sub-family *Quiscalinæ*. The birds belonging to this genus have the bill longer than the head, of a conic shape, entire, and compressed, with the culmen slightly curved. Their tail is graduated, with the sides bent upwards, or boat-shaped, and their feet are strong. These birds are social in their habits, and live almost throughout the whole year in flocks, so numerous at times that the air is perfectly darkened with them. In general they frequent the borders of forests, from whence they spread over the meadows and cultivated fields, to seek their food, which consists of worms, insects, berries, and seeds. They commit great havoc amongst the plantations of bananas and maize. At the first settlement of Europeans in North America, their numbers were so great, and the destruction to the crops so extensive, that a price was put upon their heads. Immense numbers were accordingly soon destroyed. Like other birds, however, which feed upon grains as well as upon insects, they do as much good as harm, by killing larvæ and insects which are more injurious to the crops than they are. They build their nests in society, placing them upon pine trees, and so close to each other, that it is not uncommon to see fifteen or twenty nests on the same tree. They are natives chiefly of the New World, extending from Jamaica to Hudson's Bay. A few are found in New Guinea. The typical species is *Q. versicolor*, a bird which shines with metallic lustre and brilliant colours—blue, purple, violet, green, and gold, blended with velvety-black.

Quisqualis.—A genus of dicotyledonous plants belonging to the nat. ord. *Combretaceæ*. The species are shrubs, and are natives of Amboyna, Java, and the Malayan peninsula, extending into India. The flowers change in colour from white to red. The fruit of *Q. indica*, the most common species, is reckoned a vermifuge.

R

Racama.—A genus of accipitrine birds belonging to the family *Vulturidæ*, and synonymous with *Gyphoierax*. It is distinguished by the orbits being denuded of feathers. The beak is long, and hooked only at the tip, and furnished at the base with a bluish cere. The species upon which the genus is founded, *R.* (*Gyphoierax*) *Angolensis*, is of a white colour, with the wing and tail feathers black. It is a native of Angola.

Racheosaurus (ραχις, spinal column; σαυρος, lizard).—A genus of fossil saurian reptiles, the remains of which are found in the schists of Solenhofen. The only species described is *R. gracilis*, which appears to be a connecting link between the crocodiles and other saurians.

Radiata (*radius*, a ray). *Rayed Animals.*—A sub-kingdom of invertebrate animals distinguished by their having all the parts of their body and members disposed in a radiated form, which often gives them the shape of the flowers of plants. The nervous system, when present, is without ganglia, and is composed of single filaments which are disposed in a circular form round the digestive cavity. The organs of digestion consist of a single sac or short alimentary canal. The sub-kingdom *Radiata*, which has also received the name of *Centronia*, contains the following classes—ECHINODERMATA, ACALEPHA, ZOOPHYTA or POLYPI, ENTOZOA, and INFUSORIA, &c.

Radiola.—A genus of plants. See LINACEÆ.

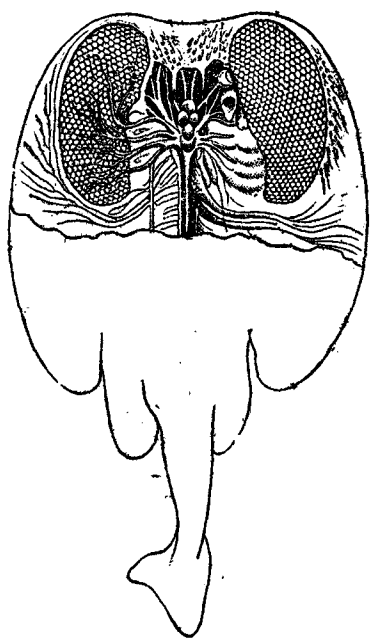
Radiolites (*radius*, a ray).—A genus of fossil molluscous animals now extinct, belonging to the class *Conchifera*, and family *Hippuritidæ*. As many as forty-two species of these problematic fossils have been discovered in the cretaceous formations. They abound in some parts of France.

Rafflesia (after *Sir Stamford Raffles*).—A genus of phanerogamous plants belonging to, and forming the type of the nat. ord. *Rafflesiaceæ*. The species are stemless, leafless plants, living parasitic upon the roots of a species of vine in the island of Sumatra. The position of the family *Rafflesiaceæ* in the natural arrangement of plants has given rise to considerable doubts and discussion. They have by some been placed in the class *Dicotyledones*, but are now referred by some of the best botanists to the class *Rhizogenæ*. The flowers of the *Rafflesiæ* are sometimes very large, the plants often appearing as if composed of nothing else. In one species, *R. Arnoldi*, the flower has a diameter of three feet, is capable of containing twelve pints of fluid in its cup, and sometimes weighs fourteen lbs.

Raia. *The Skate.*—See RAIIDÆ.

Raiania.—A genus of plants dedicated to the memory of John Ray. Plumier, who formed the genus, called it the *Jan-Raia*, Linnæus changed it to *Ra-jania*, and Sir J. E. Smith has subsequently altered the name to *Raiania*. It contains several species, most of which are natives of St. Domingo. Two or three are found in Japan.

Raiidæ. *The Ray family.*—A family of fishes belonging to the order *Chondropterygii*, or cartilaginous fishes. The rays are characterized by having a horizontally flattened body, large, fleshy, and expanded pectoral fins, united in front to the muzzle by a peculiar cartilage arising from the nasal part of the skull, and called the naso-pectoral cartilage, and behind to the ventral fin and the spine. The mouth of most of them is armed with tubercular teeth placed in close quincunx order on the maxillæ. The eggs have a brown coriaceous shell of a quadrangular form, with the angles prolonged into points. The family contains several genera and many species. The genus *Raia*, which gives its name to the whole family, contains those fishes well known by the name of skates. The body of those fishes is of a rhomboidal form, covered with a skin generally armed with more or less numerous spines or prickles. The tail is slender, of considerable length, and armed with small spines. Skates are numerous on the British coasts, and some of the species are used as food. Their egg cases are called sea-purses and skate barrows. One of our most common species is the blue or gray skate, *Raia batis*. It is the thinnest in proportion, and the largest of all, some specimens having been taken weighing 200 lbs. The thornback, or rough ray, *R. clavata*, has its body covered with spiny plates, is frequently taken on our coasts, and along with the homelyn or sand ray, *R. miraletus*, is the most common kind of skate in the London market. All three are good eating. They live upon small crustacea, shell-fish, marine insects, &c. The genus *Trygon* contains those species known by the name of the sting-rays. The most common species is *T. pastinaca*, the sting-ray or fire flaire. The tail of this fish is very long and slender, and armed with a long bony spine, serrated on both its edges. With this tail the animal is capable of inflicting very severe wounds on such as incautiously attempt to handle it; and, in fact, it answers the purpose both of an offensive and defensive weapon. It is cast annually. The sting-ray was well known to the ancients, who attributed wonderful power to the venom believed to be contained in the spines of the tail. It is found on the English coasts, and is a native also of the Mediterranean, Atlantic, and Indian seas. The genus *Myliobatis* contains those species which are known by the name of the eagle-rays or sea eagles. They have a long tail like the sting-rays, but their pectoral fins are very broad, so that they in some measure resemble a bird of prey with its wings expanded.



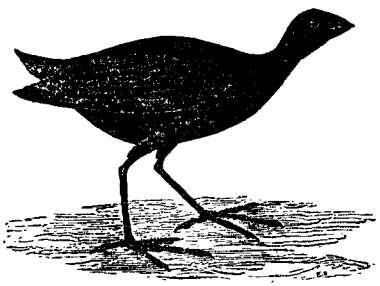
Torpedo and its electrifying organs.

The genus *Cephaloptera* contains those species called horned-rays. They resemble the eagle-rays, but their head is truncated in front, and the anterior edge of the pectoral fin is expanded

in the form of two horns. *C. giorna* is the only species known in the seas of Europe; it grows to an enormous size, specimens having been taken near Nice of the weight of 600 and 1,200 lbs. The genus *Torpedo* contains those fishes so remarkable for their power of communicating at will powerful electric shocks, and hence called electric rays. These fishes are of a nearly circular form, with a thick, short, fleshy tail, cylindrical at the extremity. The organs in which the electric power is contained are two in number, lodged in either side of the head, and encompassed by the gills and the anterior border of the pectoral fins. They consist of a mass of small, vertical, hexagonal tubes, which are filled with mucous matter, and largely provided with nerves from the eighth pair. There is one species of torpedo found on our shores, the British torpedo, *T. vulgaris*. The shocks given by this fish, though smart, are not so benumbing as those of *Gymnotus*. They probably enable it to stun its prey; and it is likely enough that this apparatus serves also as a means of defence against its enemies. The genus *Rhinobatis* contains the beaked-rays. These fishes have the muzzle generally beaked and pointed, and the tail thick. They connect the true rays with the sharks. They are found living in the Mediterranean and Atlantic Seas, and on the coast of Brazil.

Rallidæ. *The Rail family.*—A family of birds belonging to the order *Grallæ*, and distinguished by the following characters. Beak compressed, short; nostrils naked, open; legs of moderate length, scutellate; feet large, the toes being long and furnished with short, strong claws; wings of moderate size, and tail very short. The species belonging to this family frequent exclusively the borders of rivers, brooks, and moist meadows, and live a great deal in the water. The type of the family is the genus *Rallus*. The rails are remarkable for the compressed form of the body, which is owing to the narrowness of the sternum. They are shy, timid birds, when disturbed flying to some distance, and then remaining in a state of complete rest. They run with great swiftness, the head and body inclined forwards, and the legs much bent. They seldom fly, but when they do, their flight is heavy, low, with their feet hanging down, and not long continued. During the day, they generally keep secluded in shady places amongst the grass, but in the evening, and early morning, they sally forth to seek their food, which consists of both animal and vegetable matters, worms, insects, small molluscous animals, seeds, and the tender shoots of aquatic herbs. They are solitary birds, never uniting in families, and when they migrate from one place to another, it is by night. They construct their nests on the ground, amongst the plants which grow on the edge of the water. Their flesh is excellent eating, especially in autumn. *R. aquaticus*, the water-rail, is not uncommon in this country, but is still more abundant in the marshy places of France, Holland, and Germany. The Virginian rail, *R. virginianus*, very much resembles the water-rail of Europe. It is found in the United States, and is a migratory species. The land-rail, or corn-crake, *R.* (*Ortygometra*) *Crex*, is a well known member of this family. It resembles the water-rail, but selects as its place of abode grassy meadows, young corn fields, osier beds, and marshy grounds. It is very shy and retiring in its habits, and seldom permits itself to be seen. Indeed were it not for the peculiar grating note of the male (which has been compared to the noise made by drawing a finger along the teeth of a comb), sometimes appearing as if beneath one's feet, and again sounding as if at a great distance, its presence would seldom be betrayed. It is a migratory bird, and appears to be extensively spread over the whole continent of Europe. It arrives in this country about the latter end of April, or beginning of May, taking its departure southwards in October. Like the water-rail, the corn-crake or land-rail runs very swiftly, but flies heavily, with the legs hanging down; and after it is once flushed, it is almost impossible to make it take wing a second time. When dressed on the same day on which it is killed, with the trail in, it is very delicious, and has always been esteemed for the table. In addition to the rails proper (*Rallinæ*), the family rallidæ contains the water-hens, coots, &c. (*Gallinulinæ*). The water-hen, or moor-hen, *Gallinula chloropus*, is a widely distributed bird, being found over the whole of Europe, as well as in great part of Africa and India. The water-hen in this country frequents rivers, ponds, and marshy places, and lives upon aquatic insects, worms, molluscs, seeds, and water herbage. Its flesh in autumn, when well fed, is well flavoured, juicy, and sapid. The coot, *Fulica atra*, is another widely distributed bird belonging to this family, being found throughout the whole of Europe, and in Japan. It is indigenous to Great Britain, residing in all large sheets of water, but giving preference to those overgrown with rushes, and margined with a belt of thick reeds and luxuriant vegetation. The coot is about sixteen inches in length, and is of a black colour, except the beak, which is white, and a plate, or lobe, extending from the bill to near the crown of the head, which is destitute of feathers, soft, smooth, and round, giving rise to the name by which it is often known, the *Bald Coot*. It swims and dives admirably, but flies heavily, and with effort. Its flesh is not much relished, except when it is young. The genus *Porphyrio* appears to differ from the other gallinulinæ by having a very powerful, short, high bill, well calculated for crushing hard grains and seed, snails, frogs, &c. *P. hyacynthinus* is perhaps the most common species. It is a fine bird, with a brilliant plumage of a turquoise and indigo-blue on the body, red bill and legs, and white under tail coverts. It lives on the borders

rivers, and in marshy situations, the great xpansion of its large feet enabling it to pass ith facility over soft, oozy mud, aquatic herbage, c. Its actions and appearance on the dry land re, however, both elegant and graceful. It is



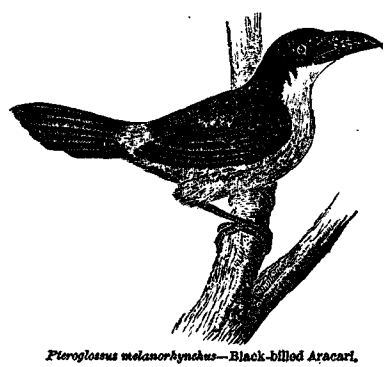
Porphyrio hyacynthinus—Gallinula or Water-hen.

quick in its movements, running with ease and swiftness, but its flight is heavy and laboured. The porphyrio is abundant in the southern and eastern parts of Europe, and its range extends over a great portion of Africa to the south, and as far as the Himalaya mountains to the east. One of the most curious birds belonging to this family is the *Notornis* of New Zealand. See NOTORNIS.

Rallus. *The Rail.*—See RALLIDÆ.

Ramalina (*ramale*, dried branches). — A genus of acotyledonous plants belonging to the order *Lichenes*, and tribe *Parmeliaceæ*. About fifteen species are known, most of them natives of temperate regions. Some of them, as *R. polymorpha* and *R. scopulorum*, abound in colouring matter. *R. calicaris* contains a viscous substance, which is equal to, and is used as glue.

Ramphastidæ. *The Toucan family.* — A family of birds belonging to the order *Scansores* or climbers, and containing many species well distinguished by their having very large, light, cellular beaks, which are irregularly notched on the edge, and curious long feather-like tongues. They are peculiar to tropical America, where they seem to represent the hornbills of India and Africa. Though the beak of the toucans is very large, compared with the size of the bird, it is in reality very light, its interior consisting of a maze of delicate cells, throughout which the ramifications of the olfactory nerves are multitudinously distributed. Their long, slender, pointed tongues are horny, and fringed, or feathered, on each side. The tail is peculiar for the facility with which it can be retroverted, or turned up so as to lie on the back. They are not possessed of strong powers of flight, being strictly arboreal in their habits, but they fly lightly, and hop and flit from branch to branch with such graceful ease and address, as to have suggested for one species the name of Ariel. They feed upon fruits, eggs, and nestling birds, and build their nests in the hollows of trees. In Brazil they are killed in great numbers during the cool season for the purposes of the table, and their feathers, especially those on their yellow breast, are used by the Indians for personal decoration. When a party of toucans alight on a tree, one usually acts the part of a sentinel, uttering loudly the cry *Tucano*, whence they derive their name. The others disperse over the branches in search of fruit, keeping up all the time a loud chattering noise, at intervals uniting with the sentry, and screaming a concert that might be heard a mile. There are two great groups into which these birds have been divided; the toucans proper, *Ramphastos*, and the aracaris, *Pteroglossus*. The type of the genus *Ramphastos* is the toco, *R. Toco*, a bird remarkable for the size and splendour of its bill, which is of a fine orange-red, with a large black patch on each side near the tip. They are very destructive birds at times in the fruit plantations, and the Brazilians shoot them partly in defence of their fruit trees, and partly for the table. The aracaris have smaller beaks than the true toucans, and are more elegant birds, their plumage on the upper parts being of an olive-green, and the under parts yellow and red, with dark bands. The many-banded aracari, *Pteroglossus pluricinctus*, is a native of the Upper Amazon and the Rio Negro, and is about twenty inches in length. The upper surface of the body is green, except the rump, which is scarlet, and the yellow breast is crossed with two bold bands of black. We



Pteroglossus melanorhynchus—Black-billed Aracari.

have selected as our illustration a very pretty species, the black-billed aracari, *Pt. melanorhynchus*.

Ramphastos. *The Toucan.*—See RAMPHASTIDÆ.

Ramtilla (*ram-tilla*, an Indian name for the oil procured from the seeds of this plant).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Helianthea*. *R. oleifera* is the typical species, and is a native of India. From its seeds a very good oil is

obtained by expression, which is used by the natives both in dressing food, and as a lamp oil.

Rana. *The Frogs.*—See BATRACHIA.

Ranatra.—A genus of hemipterous insects belonging to the family *Nepidæ*. The species of which the genus is composed are of a long linear form, with the anterior feet long and prehensile, giving them somewhat the appearance of a scorpion—hence some are called water scorpions. They are of aquatic habits, are carnivorous, and destroy great numbers of other insects in the water in which they live. The species are not numerous, but are found in the most opposite parts of the world.

Randanite.—A fine earthy deposit, consisting of gelatinous soluble silica in compact masses, and composed of the casts of infusorial animalcules. It is found near Randan, Puy de Dome, in Algiers, and at Farnham in England.

Randia (after *Dr. Isaac Rand*).—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ*. *R. dumetorum*, the bush randia, is a thorny, branching, small shrub, or tree, with a smooth yellow fruit resembling a small crab apple. This, when bruised, and thrown into the water, intoxicates, and even kills fish, like the cocculus indicus. Dried and in the form of powder, it acts upon man as an emetic.

Ranella (diminutive of *Rana*, frog). *Frog Shells.*—A genus of gasteropodous *Mollusca*, the shells of which are characterized by having the varices on each side, and so disposed as to form a continued line throughout the whole length of the shell. About fifty species are known, mostly natives of the seas of warm climates, and ranging from low water to twenty fathoms. About twenty-three fossil species have been described from the eocene formations.

Rangifer.—A generic name sometimes applied to the reindeer, *Tarandus rangifer*. See CERVINA.

Ranidæ. *The Frog family.*—See BATRACHIA.

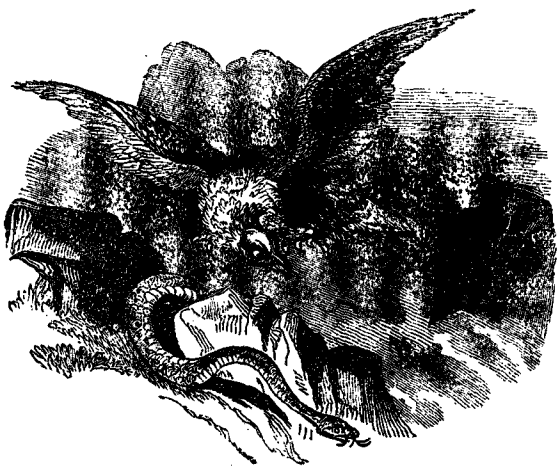
Ranina.—A genus of anomourous decapodous *Crustacea*, forming the type of a small family, *Raninidæ*. The carapace of these crustaceans is of a reversed triangular form, a little rounded posteriorly. The anterior edge of the carapace is very long, nearly straight, and armed with strong teeth, the middle one of which forms a sort of rostrum. The anterior feet are strong, compressed, of a moderate length, and their immovable finger projects but very little, so that the moveable finger is bent back against the anterior border of the hand. The only species, *R. dentata*, is a native of the Indian Ocean. It is said to come ashore and creep on to the tops of houses.

Ranunculaceæ. *The Crowfoot family.*—A family of dicotyledonous plants, containing a great number of genera, and about 1,000 species. The greater proportion are herbaceous, though some are shrubs, and they abound in a watery juice. They are scattered over all the world, though they are most abundant in the cold and temperate parts of the northern hemisphere. In Europe they are met with from the shores of the Mediterranean to the arctic regions, and from the level of the sea to the tops of mountains. They are found even just below the snow-line. In the greater number the watery juice with which they abound is acrid and caustic. This property resides more particularly in the root, but the leaves and flowers of many possess it in such a degree, that the former have been applied to the skin to produce vesication, and the latter have been known to communicate a poisonous quality to the honey which bees have made from the nectar contained in them. The genera are so numerous that they have been arranged in several subfamilies. I. *Clematideæ*, of which the genus CLEMATIS is the type; II. *Anemoneæ*, of which the genus ANEMONE is the type, and to which the HEPATICA and others belong; III. *Ranunculeæ*, of which the genus RANUNCULUS is the type; IV. *Helleboreæ*, of which the genus HELLEBORUS is the type, and to which the genera ACONITUM, NIGELLA, DELPHINIUM, &c., also belong; V. *Actææ*, or *Pæoniæ*, represented by the fine genus PÆONIA.

Ranunculus. *The Crow-foot.*—The genus which forms the type of the nat. ord. *Ranunculaceæ*. The species are numerous, upwards of 300 having been described. They are herbaceous plants, found dispersed over all the globe, but chiefly in the temperate and cold parts of the northern hemisphere. Several species are natives of Great Britain, amongst which is the celandine, *R. ficaria*, very common in moist meadows, on banks, &c. It is one of our earliest flowering plants, and is a harbinger of spring. The leaves and young shoots are eaten in France as a salad, and the root, which contains the acrid principle, was long held in great repute in the treatment of piles—hence the common name of this plant in many places is pile-wort. The buttercup, *R. acris*, common in all our fields and meadows, possesses the acrid properties of the family in a high degree, the fresh leaves being often applied to the skin to produce vesication. The acrid principle of this and other common species is very volatile; hence though the fresh leaves are very acrid, when dried they are perfectly harmless, and may be eaten by cattle with impunity. It is a vulgar belief that when predominant in pastures, the flowers impart their yellowness to the butter of cows; and hence the general name for the various species which grow in pasture lands is the *Buttercup*. Several species are cultivated in our gardens as ornamental plants, such as *R. aconitifolius*, a fine plant, growing wild in the moderately elevated parts of the Alps and Pyrenees. When it becomes double it is a handsome plant, and is known by the name of "silver buttons." *R. Thira*, another native of the same localities, is also cultivated, but is much dreaded by the natives from the poisonous effects its acrid

leaves produce in cattle which eat it. It is said the ancient Gauls knew the nature of this plant, and used its juice for poisoning their arrows. The common garden ranunculus, *R. Asiaticus*, is perhaps the finest species which our gardens exhibit. It is a native of the East, and is said to have been introduced into Europe during the time of the crusades. Great attention has been paid to its cultivation by horticulturists, and upwards of 100 varieties have been produced.

Rapaces (*rapax*, rapacious).—An order of birds called rapacious birds, containing the greater number of the birds of prey, as eagles, falcons, owls, &c. It is synonymous with the order *Accipitres* of Linnæus. The accompanying woodcut will illustrate the order.



Eagle and Snake.

Raphanus.—A genus of dicotyledonous plants belonging to the nat. ord. *Cruciferæ*. This genus contains several species of herbs, natives of central and southern Europe and eastern Asia. The roots are fleshy, fusiform, and the leaves generally lyrate at the base. The best known species is the common radish, *R. sativus*, originally a native of China, but which has been cultivated in this country for upwards of 250 years. There are two very distinct varieties, one of which, *R. sativus radicula*, is the common radish, which again is split into two other varieties, the spindle-shaped and the round radish; and *R. sativus niger*, which has a larger root, is more acrid, and is highly stimulating. *R. Raphanistrum* (*Raphanistrum arvense*), the jointed charlock, is a native of Great Britain and most parts of Europe. It is a rough leaved annual, with a slender root, and white, yellow, or purple flowers. Its seeds are very acrid; and as they are apt to get mixed with the corn of our fields, amongst which it grows abundantly, they sometimes produce much mischief. There is a disease to which the poor people in Sweden are liable, and which in some seasons commits great havoc amongst them, called "raphanie," on account of its being believed to be produced by the peasants eating this seed. Bees, however, are said to be very fond of the flowers, and the wood pigeon feeds upon the seeds.

Raphidia (*ῥαφίς*, an eel).—A genus of neuropterous insects, forming the type of the family *Raphidiidæ*. The insects of this genus are distinguished by their having a large flattened head, filiform antennæ, and the prothorax cylindrical, and as long as the abdomen. Their anterior feet are simple, and the abdomen in the females is furnished with a long ovipositor. The species are not numerous, are of moderate size, are active, and are found chiefly in the neighbourhood of woods. In England they are called snake-flies, from the ease with which they twist their long neck and body in all directions. The larvæ live under the bark of trees, or in the wood itself. They are long and narrow, with strong, pointed jaws, and short feet. They creep slowly, but leap with great rapidity when disturbed. They prey upon small insects.

Raptatores = Raptores (*raptor*, one who lives by rapine). *Rapacious Birds.* — Terms employed by some naturalists to designate an order of birds containing the eagles, &c. It is synonymous with the order ACCIPITRES.

Rasores (*rado*, to scrape).—A term employed by some ornithologists to designate an order of birds which contains the poultry, pheasants, partridges, &c., and is synonymous with the order *Gallinæ* of Linnæus.

Ratelus = Mellivora. *The Ratel.*—A genus of animals belonging to the class *Mammalia*, order *Feræ*, and family *Mustelidæ*. The animal upon which this genus is founded is a native of the Cape of Good Hope, and is celebrated for the destruction it makes among the nests of the wild bee. It lives upon the honey; and the Hottentots assert that it is guided to the discovery of these nests by the bird called the honey guide, *Cuculus indicator*.

Recurvirostra.—A genus of birds belonging to the order *Grallæ*, and family *Scolopacidæ*. The typical species is the avoset, *R. avocetta*, peculiarly characterized by its singular bill, which is long, and reflected upwards. It is a

European species, and is widely diffused over that continent, and is found also in Egypt and some other parts of Africa. It is rare in England. The feet of the avoset are palmated, but they appear to be better adapted for supporting the bird upon the soft mud than for swimming. They live on the muddy shores of the ocean and in estuaries, where they feed on aquatic animals, as small shell-fish, the spawn of fishes, &c.

Reduviidæ. — A family of hemipterous insects, containing a number of species, which differ in the great development of their feet, &c., from all others of the order. They are essentially carnivorous and terrestrial, running very swiftly on the ground. Their beak is sharp and of considerable length, and strong enough to pierce the skins of the animals upon which they live. The species are scattered all over the globe, but are much more numerous in warm than cold countries, only a few being found in Europe. The largest and finest are natives of India and America. The typical species, however, is European, *Reduvius personatus*. It is generally found inside of houses, living amongst dust, especially in its young state. Being then furnished with hairs on its body, it is generally so covered with dust as to conceal itself completely from sight. It is this habit which gives it its specific name. It lives upon other insects, and more especially upon the bed-bug; so that it is really a useful insect, though it is not generally found in sufficient numbers to do great service. When handled it stings very sharply.

Regalecus (*rex*, king; *halecus*, herring). *The King of the Herrings.*—A genus of fishes belonging to the order *Acanthopterygii*, and family *Gymnetridæ*. A species of this genus, *R. Glesne* (=*Gymnetrus Hawkenii*), is found on the coast of Great Britain. It is flat, narrow, and thin, and of very considerable length, some specimens measuring nine or ten feet. A very fine specimen was exhibited a few years ago in London, taken off the coast of Northumberland, and attempted to be passed off as the "sea serpent." The specimen is now in the British Museum.

Regulus.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Luscinidæ*, sub-family *Sylvinæ*. Three species of this genus are European, and three other closely allied species are natives of America. The golden crested wren, *R. cristatus*, is the best known species, and is supposed to be the least of all European birds. It weighs about eighty grains, and its eggs weigh nine or ten grains each. When stript of its feathers the body measures only about one inch in length. It builds its nest in tall trees, suspending it like a hammock from a branch, by a kind of cordage made of the materials of which the nest is chiefly composed. The song of this fairy-like little bird is very sweet, and in this country is heard as early as the beginning of February. It is very agile, and continually in motion, fluttering from branch to branch, clinging to them in every situation, and often hanging like the titmouse. Its food consists of small insects, larvæ, small worms, and seeds.

Remija.—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ*, and sub-order *Cinchoneæ*. The species are small, slender trees, natives of Brazil, and contain the bitter principle which characterizes the family. The natives use the bark as a substitute for that of the cinchona.

Remora (*remora*, delay). *The Sucking Fish.* —A genus of fishes. See ECHENEIS.

Reptilia (*repo*, to creep).—A class of animals belonging to the sub-kingdom *Vertebrata*, and containing those animals so well known as tortoises, see CHELONIA; lizards, see LACERTINIDÆ; crocodiles, see CROCODILIDÆ; serpents, see OPHIDIA; frogs, see AMPHIBIA, &c. Reptiles are placed, in the zoological arrangement, between birds and fishes. The species are not so numerous as those of mammalia and birds; and the numbers found in cold and temperate climates are few in comparison to those existing in hot countries. The strangeness and ungainliness of many of these animals, and the character which numbers of them bear for malignity of disposition, and the deadly poison they possess, have inspired a feeling of horror and disgust amongst almost all nations. The serpent is one of the first animals mentioned in Scripture, and the various forms of the reptile class have continued ever since to attract the attention of mankind. In a previous state of this world's existence, these creatures likewise presented extraordinary forms; and few fossil remains brought to light exhibit more monstrous proportions than some of these do. See ICHTHYOSAURUS, &c. Reptiles are distinguished from the other classes of vertebrated animals by their having neither hairs on their body, nor teats, like *Mammalia*; by their body being never covered with feathers, like birds; whilst their possessing feet and a tail, resembling in form those of quadrupeds, and being destitute of fins, separate them from fishes. They are air-breathing animals, and cold-blooded. The skin is clothed with horny imbedded plates, or imbricated scales, which are covered with a thin and often deciduous epidermis. Their lungs are cellular, and their heart is trilocular. With only one or two exceptions, they are oviparous, and the young undergo no transformation after birth. Reptiles, by the latest systematic zoologists, have been divided into two sub-classes—1. Those the bodies of which are covered with overlapping scales, such as the lizards and serpents, *Squamata*, the scaly reptiles; and 2. Those the bodies of which are covered with square, imbedded plates, as the tortoises and crocodiles, &c., *Cataphracta*, the shielded reptiles. Formerly the frogs and toads, &c., which have the skin naked, and covered with mucus, formed a third sub-class, under the name of *Batrachia*. They are

now, however, considered to form a separate class, under the name AMPHIBIA.

Reseda. *The Mignionette.*—A genus of dicotyledonous plants belonging to, and forming the type of, the nat. ord. *Resedaceæ*. The genus consists of herbaceous, rarely shrubby plants, which chiefly inhabit the Mediterranean region of Europe, and the parts of Africa situated outside the tropics. The type of the genus is *R. luteola*, weld, woold, or woad, a biennial species, found growing by waysides and waste, stony places, in Great Britain and other parts of Europe. It is cultivated for the sake of the yellow dye which it yields, and which is used for dyeing woollen stuffs. A solid lake is obtained from it, used in painting. The sweet mignionette, *R. odorata*, is a well known favourite annual of our gardens, and is cultivated universally for its delicious fragrance. It is originally a native of the north of Africa and Egypt. By preventing the development of its blossoms, it is rendered suffruticose, and is then known by the name of the tree mignionette.

Restiaceæ. *The Cord-leaf family.*—A nat. ord. of monocotyledonous plants, consisting of herbs or under-shrubs, with narrow, simple leaves, or none, naked or sheathed culms, and spiked or capitate bracteated flowers. Most of them have a scaly, creeping rhizome, or root-stock. The greater number of these plants live at the Cape of Good Hope, or in Australia, where they form a hard, wiry, rush-like herbage. They are of little importance to man. The hard texture of some renders them suited for thatch for houses; and the tough, wiry stems of *Wildenovia teres* and some others are used for making baskets and brooms. *Eriocaulon* is a British genus. A species, *E. septangulare*, is found in the Isle of Skye and in Ireland; and in Brazil some species exist six feet high, and branched.

Retepora (*rete*, a net; *porus*, a pore).—A genus of molluscoid zoophytes belonging to the order *Polyzoa* (see this word), and containing several pretty species, the cells of which are immersed in a foliaceous, calcareous polyzoary, opening at one surface only, and forming a kind of network. The typical species, *R. cellulosa*, is an inhabitant of the Mediterranean and Indian Seas, and is often called "Neptune's ruffles."

Retinalite.—A rock nearly allied to serpentine, being composed of silica, alumina, magnesia, oxide of iron, and water, with a little soda. It occurs in yellow, resinous-looking, amorphous masses, which vary in colour from brown, gray, yellow, to black. It is found at Granville, Lower Canada.

Retinasphalt = Retinite.—A mineral resin, occurring in solid, pale brown ochraceous-yellow masses, with a resinous lustre in the fracture. It is fusible at a low temperature, giving out at first an agreeable odour, then a smell of bitumen, smokes much, and leaves a black, brittle residuum. When first dug up it is flexible and elastic, but loses this property in the air. It is found in the bovey coal of Devonshire, and in vegetable earth near Helbra, Mansfield; in the brown coal near Halle, and at Wolchow, in Moravia.

Retinite.—A synonym of RETINASPHALT.

Rhamnaceæ. *The Buckthorn family.*—A nat. ord. of dicotyledonous plants, consisting of trees and shrubs, which are found generally distributed over the globe, and grow both in temperate and tropical regions. They are often spiny, sometimes climbers, and have regular, small, greenish flowers, and fruits of a fleshy or dry nature, separating into three parts. The bark and wood, sometimes also the leaves, and more frequently the fruits, contain a bitter extractive substance, mixed occasionally with acrid, astringent, or colouring matters. Some of the species, in consequence, are febrifuge and tonic, others are irritant, being purgative or emetic, and others, again, are employed as dyes. Though this is the general character of the fruits of this family, there are others which are sweet and succulent, and are used for food—as various species of the genus ZIZIPHUS (which see). The genus *Rhamnus* is the typical genus, and contains several species remarkable for their active properties. *R. catharticus* (called also *Spina Cervina*), the common buckthorn, is a native of Europe, and is also indigenous to Great Britain. It is a shrub, and its black, succulent berries are used as a hydragogue cathartic in cases of dropsy. The greenish juice becomes gradually red by the formation of acetic acid in it; and it may be preserved unchanged in the form of syrup. When mixed with lime and evaporated to dryness, it forms the pigment known by the name of sap-green or bladder-green. The fruit of *R. frangula*, a British species, is emetic and purgative, and the berries of *R. infectorius*, a dwarf shrub found in waste, rocky places in the south of Europe, are called French berries, and are used for making a yellow dye.

Rhamnus.—See RHAMNACEÆ.

Rhea.—A genus of birds. See STRUTHIONIDÆ.

Rheum. *The Rhubarb.*—A genus of dicotyledonous plants belonging to the nat. ord. *Polygonaceæ*, and containing a good many species some of which are of much importance as furnishing the valuable medicinal substance called rhubarb. Long as the rhubarb root has been known, it is remarkable that the exact species of *Rheum* yielding it is still unknown. Thirteen species have been mentioned as affording it, but of all these *R. palmatum* has perhaps the best title to be considered the true rhubarb plant. The species are all natives of the cold parts of the world, as the Altai mountains, Siberia, Thibet, north of China, and the Himalayan range. The best rhubarb is called Turkey rhubarb, and is only procured by the Russians at Kiachta from the Chinese. The rhubarb called Chinese rhubarb may be the produce of the same species

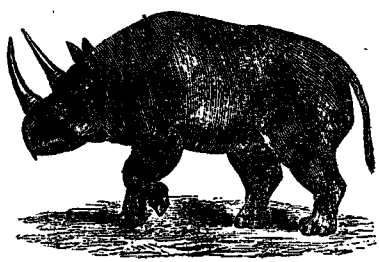
growing in the northern parts of that country, though the best is said to come from the heart of Thibet, within 95° east longitude, and 35° north latitude, five or six hundred miles north of Assam. Rhubarb contains abundance of *Raphides*, or acicular crystals of oxalate of lime, along with tannin, gallic acid, resin, and a peculiar yellow coloured principle called rhabarberin. The grittiness which characterizes the officinal Turkey rhubarb, is owing to the presence of these crystals of oxalate of lime, 100 grains of rhubarb root containing about thirty or forty grains of that substance. Rhubarb is employed medicinally as a cathartic, astringent, and tonic, in the form of powder, pill, extract, tincture, wine, and infusion. The stalks of the leaves of several species of *Rheum*, as *R. rhaponticum*, *hybridum*, and *compactum*, are very much used in this country for making tarts. They are agreeably acid, and are largely cultivated.

Rhinanthus (ῥίν, a snout; ἄνθος, a flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, and containing a number of species of annual plants inhabiting marshes, and only found in Europe. *R. crista-galli*, cock's-comb or yellow rattle, a common British plant, is the best example of the genus.

Rhinaster (ῥίν, a snout; ἀστήρ, a star).—A genus of *Mammalia*. See CONDYLURA.

Rhinobatis.—The beaked ray. See RAIIDÆ.

Rhinoceros (ῥίν, snout; κέρας, horn).—A genus of pachydermatous animals belonging to the order *Ungulata*, family *Elephantidæ*, and forming the type of the sub-family *Rhinocerina*. The rhinoceroses have a very blunt, rounded nose, and a protruding upper lip, which is extremely pliable, and answers the end of a small proboscis; seven grinders in each jaw, and large simple stomachs. They have three toes on each foot, a very thick skin, often forming folds, and the nose is armed with one or two solid horns, which are formed of agglutinated hairs. They are large, uncouth-looking animals, and inhabit the hotter regions of Asia and Africa. Next to the elephants, they are the most powerful of all quadrupeds. The common Indian rhinoceros, *R. indicus* or *unicornis*, is usually about twelve feet long from the tip of the nose to the insertion of the tail. Its height is about seven feet, and the circumference of the body is nearly equal to its length. Its naked, thick skin, is of a dull deep purplish gray, with a granulated or knotty surface, disposed in several armour-like plaits or folds behind and across the shoulders, and before and across the thighs, &c., and is so impenetrable as to resist the claws of the lion or tiger, the sword or the shot of the hunter. It has only one horn, which in some instances is nearly three feet in length, and is used by the animal as a powerful and effective weapon. In India the rhinoceros leads a tranquil indolent life, wallowing on the marshy borders of lakes and rivers, and occasionally bathing itself in their waters. Its movements are generally slow, and it carries its head low, like the hog, ploughing up the ground with its horn, and making its way by sheer force through the jungle. It is naturally quiet and inoffensive, but when provoked, furious, very swift, and very dangerous. A good deal of discussion has taken place with regard to the question whether or not this animal is identical with the unicorn or reem of Scripture. The general opinion is, that the one-horned rhinoceros was the animal spoken of by the sacred writers. The African rhinoceros, *R. bicornis*, has two horns, and differs from the Indian species in having the skin smoother, and being destitute of the armour-like folds on the shoulders and neck, &c., having instead of them merely wrinkles. It is about the size of the preceding species, and its habits are much the same. It lives upon the leaves and



Rhinoceros keitloa.

branches of succulent trees. It is a native of South Africa, and is known to the colonists of the Cape of Good Hope as the rhinoster. Two or three other species have been described, one of which, also a native of South Africa, *R. keitloa*, we have selected for our illustration of the genus. Fossil remains of the rhinoceros are not uncommon. Two species must originally have been natives of Great Britain. One of these has been described under the name of *R. tichorinus*. This animal seems to have been extensively distributed over this island, and the researches of continental palæontologists demonstrate that it was formerly associated with the mammoth in several of the more recent deposits in France, Germany, and Italy. But the most remarkable specimens of this species have been discovered in the northern latitudes of Asia. Twenty years previous to the discovery of the mammoth found enveloped in ice (see ELEPHANTIDÆ), a rhinoceros had been dug out under similar circumstances. In the winter of 1771-2, a hunter found the body of a great unknown beast in an excellent state of preservation, half buried in the frozen sand, near Zimovié de Vilouiskoe. It was about 11½ feet long, and about 3½ ells in height. The body was clothed with its skin, which resembled leather, and still retained upon it many short hairs. This huge creature has since been ascertained, from

the head and feet, which were preserved, to be the *R. tichorinus*. Though numerous remains of rhinoceroses have been found scattered over various parts of Europe and Asia, none have ever been discovered in either America or Australia.

Rhinolophus (*ῥίν*, nose; *λοφος*, a crest). *Horse-shoe Bats*).—A genus of animals belonging to the class *Mammalia*, order *Cheiroptera*, and family *Vespertilionidæ*. This genus is characterized by the species belonging to it having the nose surmounted by membranous crests, the upper one of which is lanceolate and erect, while the inferior is shaped like a horse-shoe. They are natives only of the Old World, but are pretty generally diffused over it, being found on the continent of India and its large islands, many other parts of Asia, in Africa, and over great part of Europe. They live in society, several hundreds of individuals of both sexes being found together, living in caverns, old houses, or in the large trunks of old trees. When the females are with young, they separate themselves from the males, and establish their quarters in small groups in distinct caves. They bring forth two at a birth. Like the rest of the order to which they belong, they are nocturnal and insectivorous. The largest species of the genus, *R.* (*Hipposideros*) *nobilis*, is a native of Java. Its fur is very soft, fine, long,

Rhinolophus ferrum-equinum—Great Horse-shoe Bat.

and of a brown chestnut colour above and white beneath. *R. ferrum equinum*, or great horse-shoe bat, is a native of England, and many other parts of Europe. It is about fourteen inches in width, and about three inches long in the body, but with a tail two inches more. Its fur is very soft, of an ashy-gray mixed with red above, and of a grayish hue mixed with yellow underneath. It lives in caverns, old quarries, and ancient edifices, and passes the winter in a state of torpidity.

Rhipidura. *The Fan-tail*.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Muscicapidæ*. The species are natives of Australia, and remarkable for the extent of their fan-shaped tail. They are generally seen in pairs, and are pretty, lively birds.

Rhizanthæ. *The Rhizogen family*.—A group of anomalous plants which by many botanists are placed in the class *Monocotyledones*, and form a nat. ord. of that class. Recently, however, they have been formed into a distinct class by themselves, constituting a singular transition between the phanerogamous and cryptogamous plants. Destitute of stems and leaves, they present the appearance of fungi, which they strongly resemble, moreover, in their mode of decay; and their seeds present a peculiar appearance, being more like spores than true seeds. Being furnished with flowers, however, they are entitled to rank amongst the phanerogamia. They are scaly, parasitic plants, sometimes furnished with creeping rhizomes, and are composed chiefly of cellular tissue, with a few scalariform and spiral vessels. They are never green, but assume a brown, yellow, or purple colour, and they stain any liquid in which they are immersed red. They are natives chiefly of tropical countries, though some extend into temperate climates. They are found in the East Indies, South America, the Cape of Good Hope, and the south of Europe. As examples of this curious class of plants, see BALANOPHORA, CYNOMORIUM, CYTINUS, and RAFFLESIA.

Rhizobolaceæ. *The Souari Nut family*.—A nat. ord. of dicotyledonous plants, composed of trees with opposite, palmately compound, coriaceous, exstipulate leaves, and growing in the warm forests of South America. Some of the species furnish good oil, and others yield edible fruits. The peculiar nuts sold in our shops under the name of souari or suwarrow nuts, the kernels of which are considered so delicious, are the produce of a fine large timber tree belonging to this family, *Caryocar* (*Pekea*) *butyrosum*.

Rhizomorpha (*ῥίζα*, root; *μορφη*, form).—A genus of acotyledonous plants belonging to the nat. ord. *Fungi*, and referred, with a doubt, by botanists, to the family *Byssaceæ*. They are of a peculiar appearance, resembling very much the root of a tree. The species are found in damp cellars, on decayed wood, old walls, mines, and other subterranean places. The typical species, *R. subterranea*, found in the deep coal mines of Dresden, has long been celebrated for its remarkable phosphorescent qualities, lighting up those subterranean places in such a striking and beautiful manner as almost to dazzle the eyes of the beholder.

Rhizophoraceæ (*ῥίζα*, a root; *φερω*, to carry). *The Mangrove Tree family*.—A nat. ord.

of dicotyledonous plants, composed of trees and shrubs, found growing on the muddy shores of tropical countries. Taking root in the mud, they send out adventitious roots, which often raise the main trunk much above its original level, giving the trees the appearance of being supported on stalks. *R. mangle*, the mangrove, in this way forms thickets at the muddy mouths of rivers, and presents one of the most characteristic features of the vegetation of the low shores of the tropics. The fruit of the mangrove is sweet and eatable, and the bark is astringent and used for tanning leather.

Rhizopoda (ῥιζα, root; πους, a foot).—A class of minute animals which were at one time considered to belong to the cephalopodous mollusca, and named *Polythalamia* and *Foraminifera*. They are considered by Dujardin to be nearly allied to the *Infusoria*, or rather to form a part of them, and to approach in structure and form the genus *Amiba*, which see. The animals are of a very simple organization, appearing to be merely a gelatinous mass, with no apparent organs, or viscera. They creep slowly by means of a series of filaments which they protrude through the small holes observable in the shells, and which appear like a drop of gum flowing along the surface of the substance they move upon. For an account of their coverings or shells, see FORAMINIFERA.

Rhodium.—A metal. See PLATINA.

Rhododendron.—A genus of dicotyledonous plants belonging to the nat. ord. *Ericaceæ*. The species of which this genus is composed are shrubs, or small trees, remarkable for the beauty of their evergreen leaves, and their fine large brilliant flowers. They are found in the mountainous regions of Europe, Central Asia, South America, India, and its archipelago. Their leaves are entire, alternate, coriaceous for the most part, and their flowers, of various colours, are generally grouped in a fine bouquet at the extremity of each branch. Of late years the number of species has been very much increased by the researches of botanists in India, especially in the Himalayan range of mountains. A magnificent species, originally a native of that mountainous region, and well known to our horticulturists, is called by the natives the "booram." This fine species, *R. arboreum*, the tree rhododendron, was introduced into Europe in 1817, and is now very much cultivated in our gardens and shrubberies. In its native country it rises to the height of eighteen or twenty feet, but in this climate seldom exceeds nine. Its flowers are large and scarlet coloured, and are grouped, to the number of a dozen or more, in hemispherical terminal corymbs. The leaves are lanceolate, shining, and glabrous above, white and silvery beneath. By cultivation a great many varieties have been obtained from the species, which are great ornaments to our parks and gardens. *R. ponticum* is another species very much cultivated, and is that to which most of our common garden varieties belong. It is a native of Asia Minor, particularly of the ancient kingdom of Pontus, from which circumstance it obtains its specific name. It is only about six feet high in its native climate, but by cultivation it becomes larger, reaching sometimes a height of sixteen feet. Its cylindrical stem, much branched, and of a reddish colour, bears leaves at the extremities of the branches only, and its flowers, of a fine purple colour, form a handsome terminal corymb. These secrete a quantity of saccharine matter at the bottom of the tube. A fine large species is found in North America, especially in the moist shady parts of Carolina and Virginia. This species, *R. maximum*, is known by the name of the rhododendron of America, and in its native soil is a moderate sized tree, from twenty to twenty-four feet high, but in our gardens it seldom attains a greater height than from three to six feet. Its stem is divided near the base into numerous branches, which are short and thick in proportion, and the flowers, of a purple colour, are grouped at the ends of the branches. Two or three species, as *R. ferrugineum*, the rose of the Alps, and *R. hirsutum*, &c., are European, and are found growing on the Alps, and are characteristic of a zone of vegetation immediately above that of trees, reaching to a height of 7,480 feet. The species lately discovered in the Sikkim Himalayas, are many of them very beautiful. Amongst them is one, *R. Falconeri*, with white flowers, which never occurs below 10,000 feet above the level of the sea. *R. Dalhousiæ*, a species with fine large flowers, is a parasitical plant, growing on the trunks of large trees, especially oaks and magnolias. The corolla is from $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, and as broad at the mouth, of a white colour, with an occasional tint of rose, and frequently exhaling an odour like that of the lemon. *R. barbatum* reaches a height of from forty to sixty feet, and is one of the most beautiful of the Himalayan species, having flowers of a deep puce or blood colour, forming a compact globose head, from four to five inches in diameter. Rhododendrons are unknown in Africa and Australia. Some of the species possess poisonous and narcotic qualities, a decoction of the plant of *R. chrysanthum*, a Siberian species, being used as a substitute for colchicum.

Rhodosporeæ.—A family of *Algæ*, a synonym of FLORIDEÆ.

Rhodymenia.—A genus of *Algæ*. See THALLOGENÆ.

Rhombus. *The Turbot.*—See PLEURONECTIDÆ.

Rhus. *The Sumach.*—A genus of plants. See ANACARDIACEÆ and COPAL.

Rhyncops. *The Skimmer*, or *Cut Water.*—A genus of web-footed birds. See LARIDÆ.

Ribes. *The Gooseberry* and *Currant.*—A genus of dicotyledonous plants belonging to the nat. ord. *Grossulariaceæ*. The species may be arranged in two groups, the one composed of

shrubs armed with prickles, the other of shrubs destitute of prickles. The typical species of the first group is the common gooseberry, *R. grossularia*. This well known shrub is a native of England and Scotland, is indigenous to France, Germany, and Switzerland, and has been found in India and North America. The name "gooseberry" is said by some authors to be a corruption of "gorse-berry," because its prickles resemble those of the furze, or gorse, though others derive it from the berries having been used as sauce for geese. The unarmed group is represented by the common red and black currants. The red currant, *R. rubrum*, is a native of Europe and Siberia, and the northern parts of America. It is found wild in the mountainous parts of England and Scotland. The name of "currant" seems to be derived from the similarity of the fruit to that of the corinth raisins or small grape of Zante, which are commonly called corinths, or currants. The black currant, *R. nigrum*, is found in much the same situations as the last, and occurs more abundantly in the north than in the south of Europe. The peculiar strong smell of the leaves is very characteristic. The taste of the fruits of the various species of the genus *Ribes* depends upon a mixture of saccharine matters with malic, citric, and pectic acids. Some of the species, especially of the unarmed group, are very ornamental plants, and are much cultivated for their beauty.

Richardsonia.—A genus of plants. See IPECACUANHA.

Ricinula.—A genus of gasteropodous *Mollusca* nearly allied to the genus *Purpura*, and remarkable for their tuberculated or spiny shells, the aperture being contracted by callous projections on the lips. About twenty-five species are known, all natives of the seas of warm climates.

Ricinus. *The Castor Oil Plant.*—A genus of apetalous dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*. The species of which this genus is composed are herbaceous, or arborescent, growing sometimes to a good height, and occurring in Asia and Africa. One of the species is widely diffused, both in a wild state and cultivated. This plant, the palma christi, or castor oil plant, *R. communis*, is originally a native of India, where it grows as a tree of considerable size. It was known to the ancients, and is mentioned in the Bible, and by several old Greek authors. The seeds contain a quantity of thick oil, which is well known under the name of "castor oil." This oil forms an excellent purgative medicine, and the test of its purity is its being able to be dissolved completely in cold alcohol. The best kind of oil is obtained by expression without heat, and is called "cold drawn castor oil." Besides this comparatively bland oil, there exists in the seed a powerfully cathartic constituent, which remains behind when the oil is expressed, and which is destroyed, or evaporated, under the process of ebullition.

Ricinus.—In Entomology this name is used for a genus of *Acari*, containing the creature called the *Tick*.

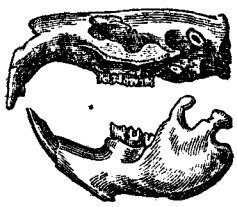
Rimulina.—A genus of minute animals belonging to the class *Rhizopoda*, or *Foraminifera*. The species are few in number, and are characterized by having the shell or covering free regular, equilateral, with a single marginal opening in form of a longitudinal slit.

Rissoa (named after *M. Risso*, the naturalist of Nice).—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of a small family called *Rissoidæ*. The species are numerous, about seventy of this genus and the sub-genus *Rissoina* having been described. They are generally small shells, abounding most in shallow water, near shore, on beds of fucus and other marine plants. They are either elongated or somewhat globular, with a rounded aperture, the peristome entire, continuous, and the outer lip slightly expanded and thickened. The animal is provided with a sub-spiral horny operculum which exactly fits the mouth of the shell. They are universally distributed, but are most abundant in the temperate parts of the northern zone. Twenty-seven have been described as British, though probably some of these may belong to allied genera. The fossil species are more numerous than the recent, upwards of 100 having been noticed.

Robinia (after *M. Robin*, a French botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*. It is composed of shrubs and trees, some of which grow to a considerable height. They are mostly natives of America. The leaves are pinnate, and the flowers are white or rose coloured, and disposed in nodding racemes. The best known species is the false or bastard acacia, *R. pseudacacia*. It is a handsome tree, originally a native of Virginia, but now so much cultivated in Europe that in some parts it has almost become naturalized. In its native country, and full grown, it rises to a height of from fifty to seventy feet. Its trunk is straight, and the branches are armed with strong recurved spines, while its flowers, hanging in pendent racemes, possess a very agreeable odour. It is a tree of rapid growth and the wood is hard, compact, firm, and flexible. In consequence of this, and its resisting the alternate exposure to air and water, it is much esteemed for various purposes. One of its principal uses is for making what are called trenails by which the timbers of ships are fastened together. For this purpose large quantities of timber are imported, and extensively used in the Royal dockyard at Plymouth. The leaves, when young and fresh, make a good fodder for cattle; and in St. Domingo the flowers are used for making a distilled liquor, which is said to be very delicious.

Roccella (*rocca*, Italian word for rock).—A genus of lichens, from which is obtained the dye called orchil. See THALLOGENÆ.

Rodentia (*rodo*, to gnaw).—An order of animals in Cuvier's system corresponding with Linnæus's order *Glires*. The principal characters are derived from the teeth. They have two great incisor teeth in each jaw, separated from the molars by a wide space, and admirably adapted for gnawing vegetable substances—hence the name of *Rodents*, or *Gnawers*. This order contains the mice and rats, MURIDÆ; the hares and rabbits, LEPORIDÆ; the squirrels, SCIURIDÆ, &c. Many fossil remains of animals belonging to this order have been found.



Teeth of Rodentia.

Rollulinæ.— } A family and genus of par-
Rollulus.— } tridges. See TETRAONIDÆ.

Romanzovite.—A variety of garnet resembling cinnamon stone. It is found at Kimito in Finland.

Rosa. *The Rose.*—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*, and sub-order *Roseæ*, of which it forms the type. The genus *Rosa* is the most universally admired and cultivated genus of plants. It contains numerous species, amongst which are some of our finest flowers. The rose is called the queen of flowers, and whether we regard it in the light of the beauty of its handsome flowers or the delightful fragrance of its odour, it well deserves the name. Poets of all ages have celebrated it in their sweetest strains; botanists have chanted its praises in all countries; and horticulturists have made it the subject of their chief study. The species are mostly shrubs armed with spines, with alternate pinnate leaves and terminal flowers. These are generally large, and of a colour which takes its name from the plant. They are found in almost every country in the northern hemisphere, both in the Old and New World; from Sweden to the north of Africa; from Kamtschatka to Bengal; and from Hudson's Bay to the mountains of Mexico. But none are found in South America or Australia. About 160 species have been described, but by cultivation the varieties have increased to some thousands. Many establishments of horticulturists depend entirely upon the rearing and cultivation of roses, which indeed constitute a considerable article of commerce. *R. centifolia*, the hundred-leaved, cabbage, or Provence rose, is one of the most beautiful of all the species, and one of the most interesting to the florist. Its native country seems to be unknown, but it has been found wild on the eastern side of the Caucasus. The varieties now produced by cultivation are very numerous, and for size, beauty of form, delicate tints of colour, and sweetness of perfume, the *Cabbage roses* are unequalled amongst all our vegetable productions. One of the most lovely varieties is the moss rose, *R. centifolia muscosa*. *R. Damascena*, the damask rose, is a native of Syria, and is thought to have been originally brought from Damascus. Many varieties of this rose exist. Some of them are more highly perfumed than any of the other species, and are accordingly preferred for cultivation in the East for procuring the essential oil called atr of roses. At Ghazeepore, it is stated, 100,000 roses, the produce of 10,000 bushes, yield only 180 grains of atr. *R. gallica*, the French rose, a native of France, of the neighbourhood of Geneva, Austria, Piedmont, and the Caucasus, is the species which yields the petals so much used in pharmacy, and employed in the form of infusion as a tonic and slightly astringent remedy. *R. canina*, the dog rose, is a very common species, growing in all our hedges, and derives its name from its supposed virtues, at one time believed in, in curing canine madness. A conserve made of the fruit is used in medicine as an acidulous refrigerant and astringent. *R. rubiginosa* is the well known sweet briar or eglantine, and is common in Britain. The leaves exhale a delightful odour. The Chinese rose, *R. Indica*, has afforded numerous varieties for the garden, amongst which is the tea-scented China rose, *R. Indica odorata*. They are favourites with the florist, on account of their blooming late in the season and continuing in flower a long time. Lastly, the Scotch roses, dwarf, compact bushes, with creeping roots and numerous spines, are the product of one species, growing wild in the north of England and Scotland, *R. spinosissima*. A number of very pretty varieties are obtained from this wild plant.

Rosaceæ.—A nat. ord. of dicotyledonous plants, composed of numerous species of herbs, shrubs, and small trees. They have been subdivided into several groups or sub-orders, several of which have by many botanists been raised to the rank of orders—I. POMEÆ (*Pomaceæ*), containing the apples and pears, &c. II. *Chrysobalaneæ*, the cocoa plums—see CHRYSOBALANUS. III. AMYGDALEÆ (*Drupaceæ*); containing the almond tree, &c. IV. SPIRÆEÆ, containing the meadow sweet, &c. V. *Quillaieæ*, some of the species of which abound in a saponaceous matter, and are employed as a substitute for soap. VI. *Sanguisorbeæ*—see SANGUISORBA. VII. *Potentilleæ*—see POTENTILLA. VIII. *Roseæ*, containing the roses—see ROSA.

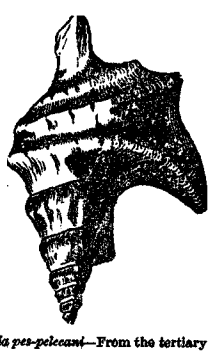
Rosalia.—A genus of coleopterous insects belonging to the tribe *Longicornes*, and family *Cerambycidæ*. *R. alpina* (*Cerambyx alpinus*), is one of the prettiest European beetles. It is of an ashy-blue colour, with a velvety-black spot near the anterior edge of the corselet. It is only found on the higher mountains of Europe.

Rosalina.—A genus of minute animals belonging to the class *Rhizopoda* or *Foraminifera*. They are of a trochoid shape, the spire of the shell being regular, complete, rolled obliquely, with a single opening in shape of a slit continued from one compartment to another. Several species are found recent, living fixed upon fuci; and several others are found fossil.

Rosmarinus. *The Rosemary.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*. It contains only one species, *R. officinalis*, the common rosemary. The rosemary is a shrub which is found growing in various parts of southern Europe, on the Mediterranean coast, and in North Africa. It is very bushy and leafy, about four feet high, with sessile, entire, linear leaves, revolute at the edge, and covered with white hairs underneath. The flowers are of a pale blue, or violet colour, disposed in small axillary racemes. It is one of the most aromatic plants of the whole family to which it belongs, and contains in great abundance an essential oil, called oil of rosemary. This oil is much used in perfumery, and enters into the composition of several preparations for the toilet, such as Eau de Cologne, &c.

Rossia (after *Sir John Ross*).—A genus of cephalopodous *Mollusca* belonging to the family *Teuthidæ*. The typical species is a native of the arctic seas, and was first discovered by Sir John Ross in Regent's Inlet. Two other species are natives of the British seas.

Rostellaria (diminutive of *rostrum*, a beak).—A genus of molluscous animals belonging to the



Rostellaria pes-pelecani—From the tertiary strata.

class *Gasteropoda*, and family *Strombidæ*. The shells are fusiform, with an elongated spire of many whirls, and are remarkable for their long canals; the posterior one running up the spire, and the front one containing the animal's long proboscis. The outer lip is more or less expanded, toothed or entire, and the animal has an operculum. Several recent species are known, inhabitants of warm seas; and many others are found fossil in the tertiary strata. *R. pes-pelecani* is found both fossil and recent.

Rotalia or **Rotalina.**—A genus of minute animals belonging to the class *Rhizopoda* or *Foraminifera*, and composed of a considerable number of microscopic shells, of an orbicular or spiral form, convex above. The compartments are numerous, long, radiating, extending from the circumference to the centre, and having a marginal opening of a trigonal shape, and reversed. The recent species are numerous in the European seas, and a considerable number are found fossil in the secondary strata.

Rotatoria (*rota*, a wheel). *Wheel Animalcules*).—A class of minute animals, formerly arranged amongst the *Infusoria*; but on account of a higher degree of organization possessed by them, now removed from these animals. Some naturalists place them amongst the *Crustacea*, from which, however, they differ in several essential characters. Others make them a group of the great class *Vermes* or worms; whilst a third contends that they belong to the *Echinodermata*; being nothing more than permanent larva forms of echinoderms. The species are numerous, all aquatic, very transparent, without legs, and with the anterior part of the body furnished with a retractile, often lobed disc, upon which are usually placed vibratile cilia, which, when in motion, present the appearance of one or two wheels revolving swiftly in opposite directions. This rotatory disc or wheel organ is the most distinguishing character of the class, and is that which has given it its name. It varies much in structure, forming characters for the different families and genera. The body is covered with a firm and usually smooth integument, into the centre of which the animal can retract itself at pleasure, as into a shell; and in most of them there is a tail-like process at the posterior end of the body, called the foot-like tail, tail-like foot, or false foot. The rotatory disc is the chief organ of motion, possessing a complete set of muscles, and is under the animal's control, being moved or kept at rest at will. A curious part of the history of these little animals is their remarkable tenacity of life, instances having occurred where they have revived after being kept for four years in dry sand. The existence of sexes has been ascertained in some of the genera, and they are propagated by ova. The young, after being hatched, do not undergo any metamorphosis.

Rotella (diminutive of *rota*, a wheel).—A genus of gasteropodous *Mollusca*, belonging to the family *Trochidæ*. The species of this genus are small shells, of an orbicular form, a polished appearance, and without epidermis. The spire is depressed, the under surface is convex and callous, and the mouth is semi-circular. The operculum is horny, orbicular, transparent, thin, and multispiral. About ten species are known, all natives of warm seas.

Rotifer (*rota*, a wheel; *fero*, to carry).—A genus of microscopic animals belonging to the

class *Rotatoria*. The species live in fresh water, or amongst wet moss, or in the mud collected in the gutters on the roofs of houses. They are of a fusiform shape, very slender, and possess the power of contracting the body into the shape of a ball. In front the body terminates in a slender, truncated proboscis, furnished with several vibratile cilia, by means of which the animals can creep like leeches. The rotatory organs (see ROTATORIA) are in the form of two large, round lobes, furnished with cilia, by means of which they swim freely about, revolving upon their axis, or when at rest, produce vortex-like motions of the water. When the cilia are in motion, the two lobes appear like two wheels revolving rapidly in two different directions. They have two eyes situated upon the proboscis, and the tail is bifurcated. *R. vulgaris* is one of the commonest species of the class to which it belongs, and has long been a favourite microscopic object, and is generally known by the name of the *wheel animalcule*.

Rotten-stone.—A mineral substance, composed of alumina, silica, and carbonaceous matter, and very much used for polishing metals, &c. It occurs massive, is dull, earthy, and opaque; is soft, soils the fingers, and is fetid when rubbed or scraped. It is found in Derbyshire, Wales, and in the State of New York.

Rubia. *The Madder.*—See RUBIACEÆ.

Rubiaceæ.—A nat. ord. of dicotyledonous plants, composed of trees and shrubs, with quadrangular branches, which are swollen at the joints, and in general with verticillate leaves. They are for the most part natives of intertropical countries, though some are found in cold climates. The species are numerous, and many of them possess remarkable properties. The bark of many is astringent, and bitter in a high degree, such as the species of Peruvian bark. See CINCHONA. The roots of some possess emetic powers, such as ipecacuanha (see CEPHAELIS and PSYCHOTRIA); whilst others are much sought after for the colouring matter they possess, as, for instance, one or two species of *Rubia*. The seeds of others again are of importance to man for their economical qualities, as, for instance, the coffee. See COFFEA. The genus *Rubia* is the type, and gives its name to the family. Several species are valuable as dyes. The roots of *R. tinctorum*, the madder, a native of southern Europe and Asia Minor, are much used for this purpose, and are employed to dye stuffs of a red or scarlet colour. It has also the singular property of turning red the bones of fowls and other animals fed upon it. The juice, when fresh, is yellow, but becomes red when exposed to the air. *R. peregrina*, another species, a native also of the south of Europe, supplies what is known in commerce as the Smyrna or Levant madder. *R. cordifolia* or *munjista*, a native of Nepâl, yields the munjeet of India, which possesses similar properties, and is used as a substitute for the *R. tinctorum*, and is known in commerce under the name of East Indian madder.

Rubus. *The Bramble.*—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*, and composed of shrub-like plants or herbs, with perennial roots and spiny stems. They are universally diffused over the mountainous and temperate regions of the Old and New World. Their leaves vary much in form, and their flowers are sometimes large and handsome enough to make them be cultivated as ornaments to our gardens and shrubberies. Some of them are well known for their fruit. *R. idæus* is the species which produces the delicious fruit called the raspberry. It is a native of Great Britain and most parts of Europe, and is also found in Asia on the Himalayas, in the north of Africa, and in America from Canada to Pennsylvania. When growing wild, the fruit is small, but being easy of cultivation, it has had much attention paid to it, and in consequence the size of the fruit has been very much increased. In the colder regions of northern Europe, as Sweden, Lapland, and Finland, this species disappears, and its place is taken by a smaller one, *R. arcticus*, the fruit of which is highly prized for its flavour amongst the natives of these countries. They prepare a spirituous liquor from it which is highly esteemed, and the leaves are made use of instead of tea. *R. fruticosus*, the shrubby bramble, a native of Great Britain, and growing almost all over Europe, produces the fruit so well known as the blackberry. This species has now become naturalized in the island of St. Helena, growing over all the hills in that island. The leaves are astringent, and have been used in medicine. *R. cæsius*, the dewberry, and *R. chamæmorus*, the cloudberry, are both British species, and produce fruits which are gathered by the inhabitants for use. *R. spectabilis*, the showy bramble, a native of America, is one of the handsomest of the genus, and along with *R. odoratus*, a Canadian species, is cultivated as an ornamental plant in the garden. The petioles, peduncles, and calices of this latter plant are covered with glandular hairs, which secrete a fragrant matter, and the flowers, which are of a fine rose colour, are highly odoriferous.

Rudistes.—A synonym of HIPPURITIDÆ.

Ruellia.—A genus of plants. See ACANTHACEÆ.

Rumex. *The Sorrel.*—A genus of dicotyledonous plants belonging to the order *Polygonaceæ*. It contains about 120 species, and consists for the most part of herbs, rarely shrubs. By far the greater number grow in the cold and temperate regions of both hemispheres, and they often possess an acid taste. Their leaves are alternate, lanceolate, sheathing at the base, and their flowers are small, and disposed in verticillate bunches. *R. acetosa*, the wild sorrel, is one of the best known species. It is very common in this country, and is found in great abundance

over almost all Europe. In France, this plant, under the name "oseille," is cultivated in kitchen gardens, and the leaves are extensively used in cookery, both as a pot-herb, and for giving flavour to other dishes. A larger species, *R. patientia*, and well known under the name of *Patience*, or everlasting spinach, is cultivated on the continent as a pot-herb, and used as spinach. It grows upwards of four feet high, and has a long and thick root, which is used in the hospitals of Paris, and has been lately strongly recommended in diseases of the skin, and more especially in cases of itch. Its virtues appear to depend upon the existence of a certain quantity of free sulphur. Several other species are well known under the general name of dock. *R. obtusifolius* and *R. crispus* are excessively common weeds, and troublesome to the agriculturist. They are both of them called the *Dock* or *Docken*, and are found growing on all our waste lands. A healing salve is made from the roots, which is used by the country people as a cure for itch. The leaves, chopped up with oatmeal, are given in some places to young poultry, and are used by the poorer classes to feed pigs.

Ruminantia (*rumino*, to chew the cud).—A name given by Cuvier to an order of mammalia corresponding with the *Pecora* of Linnæus; and in some more recent systems forming part of the order *Ungulata*. It contains those animals which chew the cud and have cloven hoofs—as the oxen, antelopes, goats, and sheep, &c. The principal characters of the order are, the existence of cloven feet and the want of canine or incisive teeth in upper jaw. They have the power of forcing back the food, after it is swallowed, from their first stomach into the mouth, there to undergo a second and more leisurely mastication—an act called *rumination*.

Rupicapra (*rupes*, a rock; *capra*, goat).—A genus of antelopes. See ANTILOPEÆ.

Rupicola (*rupes*, a rock; *colo*, to inhabit).—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Ampelidæ*. The species are remarkable for possessing an elevated crest of feathers on the head, and for the extreme freshness and delicacy of the colour of their plumage. They live in deep holes in rocks, or in obscure caverns, where the light of day is scarcely able to penetrate. It is only at night that they emerge from their hiding-places to seek for food, which consists of wild fruits. *R. aurantia*, the cock of the rock, is distinguished by the fine hoop of feathers on its head, which is of an orange colour, bordered by a narrow red circle. Its plumage is chiefly orange, but its wings are brown, with a white mark in the middle. It is a native of Guiana, and is a rare bird, becoming, it is said, more so daily. *R. peruviana*, the Peruvian cock of the rock, differs in the form and colour of its crest and tail feathers, and is a larger bird. It is a native of Mexico, and is called "Chiachia Lacca" by the natives.

Rusa.—A genus of deer. See CERVINA.

Ruta. *The Rue.*—A genus of dicotyledonous plants belonging to the nat. ord. *Rutaceæ*, of which it may be considered the type, and to which it gives its name. The species are herbs or under-shrubs, natives of the temperate and warm parts of the northern horizon of the Old World. The leaves, which are alternate, pinnate and without stipules, are dotted with glandular translucent spots filled with a volatile oil, which gives them often a strong and disagreeable smell. The common rue, *R. graveolens*, is the typical species. It is a native of the coasts of the Mediterranean, is a glaucous, hairless, erect, somewhat shrubby plant about two feet high, and possesses considerable medicinal virtues, which were much esteemed by the ancients, and are still believed in by our country people. An infusion of the leaves and unripe fruit produces very stimulant effects, and taken in a large dose will induce severe inflammation of the mucous membrane, and even death. It is considered to have a peculiar effect upon the uterus, and a large dose produces such violent effects, as to have caused it to be used in consequence by dishonest practitioners in cases of concealed pregnancy. It is also said to be vermifuge, and has been used externally to cure the itch. By distillation with water, a yellow, acrid, volatile oil is obtained, which is the active constituent. The stamina are remarkable for presenting an instance of vegetable irritability.

Rutaceæ.—A nat. ord. of dicotyledonous plants, consisting of trees, small shrubs, or herbs which are found in the south of Europe, at the Cape of Good Hope, in Australia, and the equinoctial regions of South America. They are divided into two sub-orders, *Ruteæ* and *Diosmeæ*—the first typefied by the genera RUTA and DICTAMNUS; the second by the genera BAROSMA, GALIPEA, and CORREA.

Ruticilla. *The Redstart.*—See SYLVIIDÆ.

Ryacolite.—Glassy felspar. See FELSPAR.

Rynchites.—A genus of coleopterous insects belonging to the family *Curculionidæ*. The species are hurtful to fruit trees. *R. betuleti* attacks the vine and pear tree. The leaves are the part selected. The female insect selects a leaf, cuts the petiole with her rostrum almost half through and assisted by the male, then rolls the leaf together. This roll she then pierces, laying an egg in the opening, which she pushes in, in such a manner that it remains on the inner side of the leaf. Five or six eggs are thus introduced and the leaf rolled up in such a way that it is impossible to discover, from the outward appearance, how the eggs were deposited. This beetle often produces great injury to vineyards, as by defoliating the vine the grapes will not ripen.

Rytina.—A genus of cetaceous animals. See MANATIDÆ.

Sabella.—A genus of annelides living in tubes. See ANNELIDA.

Sabellaria.—A genus of annelides inhabiting tubes made of sand and mud, and nearly allied to the genus *Amphitrite*. *S. alveolata* is the type of the genus, and is found on the coasts of Great Britain, France, and the Mediterranean. The tubes are united into a compact mass, and present orifices rather regularly disposed, like the cells of a honeycomb.

Saccharum. *Sugar Cane.*—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*. There are a considerable number of species, which are widely distributed through the tropical parts of the world. The well known substance called sugar, is the produce of three or four different species. Sugar was known to the ancients, and most probably the small quantities which reached ancient Rome found their way there from the East. In India and China the manufacture of sugar was carried on in the earliest times, the Indian species being *S. officinarum*, the China one *S. sinense*. The Indian species appears to have been introduced into Europe by the Saracens. They introduced the cultivation of this plant into Spain, and the Spaniards carried it out to the West Indies. A species appears to have been indigenous, however, both to the American continent and these islands, before the Spaniards took possession of that country; but the knowledge of the manufacture of its produce does not seem to have been known to the natives. A third species, called the Otaheite sugar cane, *S. violaceum*, has since then been introduced into the West Indies, though some botanists consider it only a variety. The importance of this product cannot well be magnified. Six or eight pounds of the saccharine juice of the plant yield one pound of raw sugar. The consumption of sugar has increased in this country amazingly. In 1700, it amounted to 10,000 tons; in 1848, the quantity imported was 318,300 tons! Some of the other species of *Saccharum*, as *S. spontaneum*, *canaliculatum*, and *cylindricum*, contain a quantity of silex in their composition, in consequence of which they are sufficiently durable to be employed in India for thatching houses, for making mats, screens, and light fences; and the natives of Bengal make their pens of the hollow stems of *S. semidecumbens* and *S. fuscum*.

Saccocoma.—A genus of fossil *Comatulæ* found in the lithographic bed of Solenhofen. Three species are described.

Saccomys (σακκος, a pouch; μυς, a rat). *The Pouched Rat.*—A genus of animals belonging to the class *Mammalia*, and family *Muridæ*. The only species known is a native of North America, and is provided with large cheek pouches.

Saccopharynx.—A genus of eels. See MURÆNIDÆ.

Sagitta.—A little animal common in the northern seas—a place for which, in systems of natural history, has not been yet definitely assigned to it. Many naturalists have arranged it amongst the mollusca, others among the annelides, and others still have ranked it amongst the acalephæ. From some recent discoveries, however, it would appear that this remarkable and curious little creature is a *fish*. In the first period of its life, it possesses a large dorsal chord or spinal marrow, a character which is so distinguishing to the *Vertebrata*; but it undergoes some essential changes in its course to maturity, becomes degraded, as it were, in its position, loses this spinal chord, and sinks down into the little animal such as we know it in its mature form

Saguerus or **Areng.**—A genus of palm trees, from a species of which, *S. Rumphii* or *saccharifera*, sago and sugar are obtained. It belongs to the same group as *Areca*.

Sagus. *The Sago Palm.*—A genus of monocotyledonous plants belonging to the nat. ord. *Palmæ*. The species, which are not numerous, are trees of moderate height. They are natives of the sea coasts of different parts of Asia, Africa, and intertropical America. The stem is simple, tolerably thick, and terminates at the top in a fine cyme of pinnate leaves. Three or four species are particularly valuable: *S. Rumphii* or *farinifera*, a native of the Moluccas; *S. vinifera* or *Ruphia*, a native of different parts of India, and the kingdoms of Oware and Benin in Africa; *S. lævis* or *inermis*, a native of Sumatra and Borneo; and *S. pedunculata*, a native of Madagascar, but now cultivated in the Isle of France, Bourbon, and Cayenne. These species abound in fecula or starch deposited in the cellular tissue, and well known, when imported into this country, by the name of sago. To obtain this highly nutritious substance, the tree is cleft perpendicularly. The spongy cellular tissue is then removed, placed on a fitting framework, and tempered well with cold water. The fecula which is washed out is deposited upon a linen cloth, through which it is strained. It is then granulated by being passed through a calender, and dried. A single tree, it is said, will yield 500 to 600 lbs. The leaves of these palms are very useful to the natives in the construction of their huts, and as palisades for making inclosures. The terminal bud is also eaten in the same manner as that of the cabbage palm; and from the cut top there flows a great quantity of juice which is manufactured by fermentation into a kind of spirit or wine.

Saiga.—A genus of antelopes. See ANTILOPEÆ.

Salamandra, Salamandridæ.—A genus and family of reptiles. See BATRACHIA.

Salar. *The Trout.*—A genus of fishes. See SALMONIDÆ.

Salicineæ. *The Willow tribe.*—A sub-order of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*. The species are lofty trees or shrubs, growing in temperate or cold countries, some of them even inhabiting high northern latitudes, where they become very small and stunted. In general they grow in damp places, or near water. The bark of many contains a bitter extractive principle called *Salicine*, which possesses the same properties as, and has been used instead of quinine. It contains also a large proportion of tannin. There are only two genera contained in this sub-order, SALIX and POPULUS.

Salicornia (*sal*, salt; *cornu*, a horn). *Glasswort.*—A genus of dicotyledonous plants belonging to the nat. ord. *Chenopodiaceæ*. One or two species which are common on our coasts, *S. herbacea* and *fruticosa*, are pickled, and used in the same way as capers. *S. herbacea* is frequently called *Marsh Samphire*.

Salientia (*salio*, to leap).—A tribe of reptiles. See BATRACHIA.

Salisburia (after *Mr. Salisbury*, the botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Taxineæ*, and remarkable for its cuneate leaves. There is only one species, the gingko of Japan, *S. adiantifolia*, a considerable sized tree, which is a native of Japan, but is found much cultivated in China. The fruit is eatable. The leaves are finely striated with veins, which give them the appearance of those of some of the species of *Adiantum*, and has in consequence procured for them the name, in this country, of the maiden-hair tree.

Salix. *The Willow Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Amentaceæ*, and forming the type of the sub-order *Salicineæ*. The species are numerous, about 300 having been described; they grow generally near running water, or in marshy places, and are found chiefly in temperate climates, though some occur in very high northern latitudes, and others within the tropics. Those species which are natives of temperate regions, as *S. alba*, grow to the height of lofty trees, whilst those which grow in high northern latitudes, as *S. arctica*, dwindle down to very low shrubs. *S. alba*, the common white willow, grows very rapidly, and in favourable situations reaches a height of forty feet and upwards. It is a native of Great Britain and many parts of Europe, and is most extensively cultivated. Hundreds of miles of road between Moscow and the Austrian frontier are planted with this tree. The wood is soft, and not very durable, but is employed for many purposes of a light nature, as in making handles for all sorts of instruments, hoops, baskets, crates, &c. The charcoal obtained from this species is superior to that procured from most other trees for the preparation of gunpowder. The bark is very bitter, and from it is obtained a bitter principle called *Salicine*, which has been employed in cases of fever, &c., as a substitute for quinine. *S. Babylonica*, commonly known as the weeping-willow, is originally a native of Asia, on the banks of the Euphrates, near Babylon, but is very much cultivated for its ornamental qualities both throughout Europe and Asia, especially in China. It adds great beauty and effect to the scenery, when planted advantageously on the banks of ponds and ornamental pieces of water. This is the species of willow upon which the weeping daughters of Zion "hanged their harps" during their captivity in Babylon. *S. viminalis*, the osier, is well known as affording the long, slender branches which are employed in the manufacture of baskets, chairs, &c. The term osier, however, is employed to designate several species. *S. Russelliana*, the Russell or Bedford willow, is one of our largest native species, and obtains its specific name from its having been first brought into notice by the Duke of Bedford. The willow tree at Lichfield, called Johnson's willow, from its having been a favourite of Dr. Samuel Johnson, was a tree of this species; and previous to its destruction by a hurricane, had attained a height of sixty feet, and a girth of thirteen feet. The bark is said to contain as much tannin as the oak, and the quantity of salicine procured from it is greater than from any other species.

Salmo. *The Salmon.*—See SALMONIDÆ.

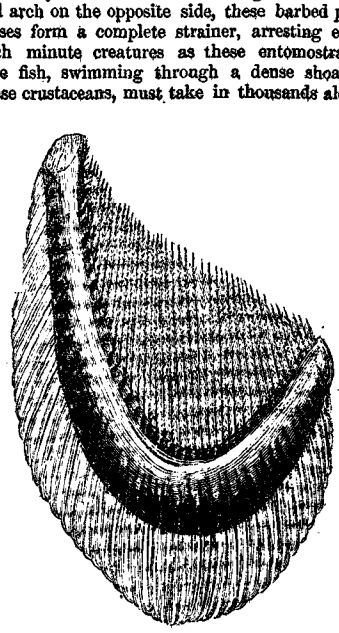
Salmonidæ. *The Salmon family.*—A family of malacopterygious fishes belonging to the group *Abdominales*. The genus *Salmo* originally contained all fishes which have from twelve to nineteen branchiostegals, teeth on the jaws, and a dorsal fin standing over the ventrals, with an adipose fin on the tail. The genus, however, so constituted, contained such heterogeneous assemblages, that it was necessary to split it up into several; and now, from the progress lately made in ichthyology, and the extension of our knowledge of new forms, three great families have been formed of the single genus. The true *Salmonidæ* include all salmonoid fishes which have numerous branchiostegals, and the cheeks or the whole head covered with scaleless integument. The *Characinidæ* are characterized by the small number of their branchiostegals, a very small mouth, with rarely any teeth on the tongue. The SCOPELIDÆ are distinguished from those others by the maxillaries not forming part of the orifice of the mouth. See this word. The family *Salmonidæ*, as now restricted, are scaly fishes, with an adipose fin, have numerous branchiostegals, a large, simple air bladder, and numerous pyloric cœca. The true salmons, the trouts, the spirlings, and coregoni, &c., are members of this family. The genus *Salmo* is the type of the family, and is the one which contains those fishes

which are of the greatest importance, and are by far the most esteemed and valuable of all that inhabit fresh waters. Almost all the species ascend rivers to spawn. The value of the fisheries, with the number of men engaged in them, is very great, and the expense of the materials which are employed in the capture of one or two species is immense. The typical species, *S. salar*, the common salmon, has an elongated body, with a rounded and thick back, a small head, with a pointed muzzle, and the upper jaw overlying the inferior. The mouth is armed with sharp teeth, which are implanted on the intermaxillaries, the maxillaries, the lower jaw, the palatines, and the tongue; but not on the body of the vomer. It is of a bluish-slate colour above the lateral line, melting into silvery-white on all the lower parts of the body; while upon the back and sides of the head are several dark coloured spots. The number of cœca is great, as many as sixty existing, and the air bladder extends the whole length of the abdomen. The male is known by the presence of a small, elevated tubercle upon the symphysis of the lower jaw. The salmon is exceedingly abundant in all the Northern Ocean. It is found in France, England, Germany, Bohemia, Switzerland, Scandinavia, Iceland, and Greenland. It exists also in Labrador and Canada, and down the American coast to the Connecticut river, in lat. 41½°; and either it, or a species so closely allied as not to be distinguished except by close comparison, abounds in the arctic seas washing the northern shores of the American continent. It does not frequent the rivers falling into the Mediterranean; and though it has been stated to be the case, it does not occur in the Persian Gulf or the Caspian Sea. In entering the mouths of the rivers, in order to spawn, the females are always observed to precede the males, depositing their ova in little holes or sort of nests, which they form in the sand at the bottom, for the males to fecundate. The young grow very rapidly; and at the present time, the subject of the changes they undergo in their progress to maturity is one exciting much interest. When first hatched, they are about an inch in length, and during the first year are called *parr*. When they remove to the sea they assume a more brilliant dress, and then become the *smolt*, varying from four to six inches in length. After a residence in the sea from two months to ten weeks, they revisit the fresh waters, and are then from 2½ to 4 lbs. weight, and are called *grilses* or *gilses*. During the ensuing winter they spawn, and are then known as the salmon. Salmon grow to a large size, full grown specimens weighing about forty pounds, though individuals are mentioned which have weighed seventy or even eighty pounds. Such are now excessively rare, owing to the perfection of the means of capturing them at the mouths of our rivers, by which the chances are very greatly against any fish escaping the various dangers by which it is environed, for such a succession of years as is likely to admit of its attaining to its full dimensions. The power these fishes have in overcoming obstacles to their progress up large rivers, at the spawning time, is very great. They shoot up rapids with the velocity of arrows, and clear considerable waterfalls, leaping a height of ten, twelve, or even, it is said, twenty-one feet. The usual time at which the salmon leaves the sea is the autumn; it remains in the rivers during the winter, and returns to the sea, after having deposited its spawn, in the spring. The fishery of this excellent and universally admired fish gives employment to many thousands of people throughout the whole of the north of Europe. Salmon fisheries, it has been said, rank next to agriculture. In this country the Scotch rivers supply by far the greatest proportion of the salmon brought to market. The total value of the Scotch fisheries has been calculated at £150,000 a-year. A good many other species inhabit the seas of Europe. *S. trutta*, the salmon trout, or as it is called in Scotland the sea trout, is the species next in value to the salmon, and in its habits is very similar. Great numbers are sent from Scotland, and they are usually from two to four pounds weight. Their flesh is much esteemed, but it ought to be dressed as soon as possible. *Salmo Rossii*, Ross's arctic salmon, is a very common species in the arctic seas, and was found so abundant by our arctic navigators in the sea near the mouths of the rivers of Boothia Felix, at certain seasons, that 3,378 were obtained at one haul of a small-sized sean. It is of a more slender form than the common salmon, and is peculiar for the length of the lower jaw. *S. hamatus* is distinguished by a projecting hook on the lower jaw in both sexes. It is about the size of the salmon, but is inferior in quality. *S. hucho* is the salmon of the Danube. *S. umbla* is the char, and is found in several of our British lakes and in the Lake of Geneva. *S. salvelinus* is the Welsh char or torgoch. *S. alpinus* abounds in Lapland, and, along with *S. carbonarius* and *S. Ascanii*, are natives generally of the northern sea, especially on the coast of Norway and Lapland. The fishes known under the name of trout are also species of the genus *Salmo*, though some naturalists separate them into a sub-genus, *Salar*, and characterize them by their possessing two rows of teeth on the vomer, instead of having none, as in the *Salmo*. *S. fario* (*Salar Ausonii*), the common river trout, is a fresh water fish, and is common in all the clear streams of temperate countries. Specimens are sometimes found two feet and a-half long, and fifteen pounds in weight. They deposit their ova in holes or nests, which they form in the sand at the bottom of the river, in the same manner as the salmon. *S. ferox* (*Salar ferox*) is the great gray trout; it inhabits the deeper lakes, and grows to a large size, but its flesh is inferior. The family *Salmonidæ* con-

tains several other genera: The smelts, *Osmerus*, differ from the salmon in having two rows of teeth on each palatine bone, but only a few in front of the vomer. In form they resemble the common trout. *O. eperlanus*, the common smelt, is from four to eight inches long; the head and body are semi-transparent, with brilliant tints of green and silver. The fins are all of a pale yellowish-white, and the ends of the caudal rays tipped with black. It is a sea fish, but inhabits rivers from August to May; and after spawning, which takes place in April, it returns to the sea. When first taken out of the water, smelts have a strong smell of cucumber, but are considered very delicate, and of delicious flavour. The genus *Thymallus* differs from the salmon, in having the mouth less deeply cleft, and the teeth remarkably fine. *T. vulgaris*, the common grayling, is common in some of our clear, rapid streams, but appears to be a very local fish. In its habits it is very similar to the trout, and swims with great rapidity. It is about eighteen inches long, and of an elegant shape. The spawning season is in April or May, and it is in its best condition in October and November. Several species are found in America, and one of these, *T. signifer*, is the most beautiful of them all. The Esquimaux call it "hewlukpowack," or the *fish with the wing-like fin*. It affords, we are told, fine sport to the angler, tugging like a bull-dog when it feels the hook. The genus *Coregonus* differs from the other *Salmonidæ* in having its small mouth armed with very few teeth, and sometimes even none. The scales are very large, and the first dorsal is not so long as it is high in front. Several species of this genus are known, all very delicate in flavour. The white fish of North America, *C. albus*, is an inhabitant of all the interior lakes of America, from Lake Erie to the arctic sea. It is about twenty inches in length, usually weighs from two to three pounds, and in some lakes, and at particular seasons, becomes very fat. Specimens are then often taken weighing seven or eight pounds, or even more; and what is rather curious is, that though rich and fat, instead of producing satiety,

Coregonus Willughbii—The Vendace.

they daily become more agreeable to the palate. The gwyniad, *C. fera*, is found in one or two lakes in North Wales, and in Ulswater and other lakes in Cumberland. The vendace, *C. Willughbii*, is only found in Great Britain, in one or two lochs at the town of Lochmaben, in Dumfriesshire. It is chiefly in the castle loch that this pretty little fish is taken, and it is reckoned a great delicacy. The loch is protected by the proprietor; but a club, composed of a certain number of the neighbouring gentry, has been for some time in existence, which meets annually at the loch on the 1st of August, for the sake of enjoying the sport of fishing. The vendace will not take with either fly or bait, and this peculiarity may be found to arise from the nature of its food. This appears to consist almost entirely of small crustacea. In the month of August, 1856, I had an opportunity of examining the stomachs of several individuals fresh captured. In each I found the stomach perfectly full of minute entomostracans, almost exclusively belonging to one species, a new and undescribed species of the genus *Bosmina*. The fish were fat and very well flavoured. A peculiar structure is observable in the gill of the vendace. The mouth is very small, and is unprovided with teeth, except a few small ones on the tongue; but on opening it, and looking down, we observe that the arches of the gills are furnished on the inner side with numerous long processes, each of which is barbed on both sides, and project into the cavity of the mouth. Meeting those of the gill arch on the opposite side, these barbed processes form a complete strainer, arresting even such minute creatures as these entomostraca. The fish, swimming through a dense shoal of these crustaceans, must take in thousands along



Gill of the Vendace magnified.

with the water which it imbibes; but instead of being expelled along with this water, which flows over the surface of the gill, and escapes from under the gill covers, they are arrested in their progress, and detained there, till a quantity is collected sufficient to be swallowed. The Ar-

gentine, *Argentina*, has the mouth small and toothless; but the tongue possesses strong hooked teeth. *A. sphyræna* is the only species, and is common in the Mediterranean. It is about 2½ inches in length. The back is of a dusky green, and the sides and covers of the gills appear as if overlaid with silver. The air bladder is thick, and loaded with the nacreous substance used in making artificial pearls. The *Characinidæ* are nearly allied to the salmonidæ; and indeed the species were formerly arranged amongst the salmons. They are fishes with an adipose fin, scaly body, scaleless head, and only four or five branchiostegals. The teeth, however, are never placed on the vomer, a character which at once separates them from the true *Salmonidæ*. The species are numerous, and are all natives of fresh water rivers in South America and Africa. No fewer than thirty-eight genera are now included in this family. Some of them are vegetable feeders, while others are fierce devourers of flesh. Such is the genus SERRASALMUS, which see. The genus *Salanx* contains only one species, a native of the rivers of China. This species, *S. Reevesii*, is known to Europeans at Canton by the name of the *Whitebait*. It is a white, translucent fish, and is eaten as a delicacy, served up in the same way as the real whitebait is at Greenwich or Blackwall.

Salpa.—A genus of molluscous animals belonging to the class *Tunicata*. The genus consists of animals which float in the open sea, and are composed of a transparent, elastic, external membrane, which is elongated and open at both extremities. The muscular fibres of the mantle, or membrane, lining the cartilaginous tissue are arranged in flattened bands. The motion of these animals through the water is produced by the alternate contraction and expansion of the tunic or membrane. At each expansion the sea water enters by the posterior aperture, and is expelled, during contraction, by the anterior one. It is the reaction produced by this jet of water that causes the animal to move along. The *Salpæ* have been divided into two groups, *solitary* and *aggregate*; but it is now ascertained that these are only different states of the same species. See ALTERNATION OF GENERATIONS.

Salpidæ.—A family of tunicated molluscs. See TUNICATA. The genus *Salpa* is the type. See SALPA.

Salsola. *Salt-wort.*—A genus of plants, from a species of which kelp and barilla are extracted. See CHENOPODIACEÆ.

Salvadora.—A genus of dicotyledonous plants belonging, according to some botanists, to the nat. ord. *Chenopodiaceæ*; by others, forming the type of a small order by themselves, *Salvadoraceæ*. The species are Indian and North African plants, with edible fruit. *S. Persica*, a native of Syria, is said to be the true mustard tree, σινηπι, or σινασι, of Scripture. Its root is acrid. Bruised and applied to the skin, is produces blisters. Its succulent fruit has the taste of cresses, and possesses an aromatic smell.

Salvia (*salvo*, to heal).—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*. The species are numerous, upwards of 300 having been described. They are herbs, or under-shrubs, and are found spread over the greater portion of the globe, though they abound most in intertropical America. Some of them are useful plants, others are ornamental to the garden. The typical species, *S. officinalis*, the garden sage, is a native of dry places in the south of Europe. The stalks and leaves are woolly, the flowers are purple, blue, or white. The sage is a well known favourite of our gardens, and has been so long cultivated that it has become naturalized in many parts of France, where it was not formerly known. It has an aromatic smell and a bitter taste, and was at one time considered useful as an antispasmodic. It is now out of use as a medicine, but is much employed in cookery to season sauces and dishes. An infusion of the leaves in the shape of tea, has been used as a stomachic. *S. sclarea*, the common clary, is another native of the dry places and road sides of southern Europe, and possesses a powerful, penetrating, but not very agreeable smell. It has also been used in medicine, as a cordial antispasmodic, and in Spain is much employed as a condiment. A species of wine has been made from it, possessing narcotic qualities. *S. pomifera*, the apple-bearing sage, is a native of Crete and the Levant. It is subject to the attack of a *Cynips*, which produces large galls similar to those of the oak. These are called sage apples; they contain an acrid aromatic juice, and on this account are used by the inhabitants of Crete as an article of diet. *S. pratensis*, or meadow sage, is one of the most common species. It grows on the dry road sides of greater part of Europe, is a very aromatic plant, and has been used as a substitute for the officinal sage. *S. splendens*, a native of Brazil, grows as a small shrub, and is, along with some others, cultivated in our gardens for its ornamental qualities.

Sambucus (σαμβυκη, a musical instrument.)—A genus of plants containing the elder, &c. See CAPRIFOLIACEÆ.

Samydeæ.—A family of apetalous dicotyledonous plants, which consists of trees and shrubs, with alternate, coriaceous, simple, very entire, or dentate leaves. These are often distichous, and dotted over with transparent points or rays, and accompanied with caducous stipulæ. The flowers are axillary, solitary, or corymbose, most frequently disposed in umbels or heads, each placed upon a jointed pedicel. The species are natives of tropical regions, especially in America.

Sanguinolaria.—A genus of conchiferous *Mollusca* belonging to the family TELLINIDÆ. The shells of this genus are oval, compressed, rounded in front, attenuated, and slightly gaping

behind. The species are natives of the seas of warm climates. About twenty are found recent, and thirty fossil.

Sanguisorba. *The Burnet.*—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*. It is composed of herbs peculiar to the temperate parts of the northern horizon. *S. officinalis* is the type of the genus, and is a common plant in Great Britain, where it is called the larger burnet. It is also a native of Asia, and as it possesses astringent qualities, was formerly considered a useful plant in cases of dysentery and diarrhœa. At one time it was cultivated in chalky districts in England, to a considerable extent, as food for cattle, but it has been superseded by sanfoin, and other artificial grasses.

Sanguisuga (*sanguis*, blood; *sugeo*, to suck). —A genus of worms containing the horse leech, &c. See ANNELIDA.

Sanseviera.—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*. The species are natives of India and Africa, and are remarkable for the strength and fineness of the fibres of their leaves. *S. Roxburghiana* is a native generally of southern India, and has been called the bow-string hemp. The leaves are three or four feet long, and contain a number of remarkably strong, fine, white fibres, which are used by the natives for making their best bow-strings. *S. Guineensis* is a native of the west coast of Africa, and affords fine strong fibres which the natives use, as in India, for making bow-strings. It has been called the African bow-string hemp, and is considered superior to New Zealand flax.

Santalaceæ. *The Sandal Wood family.*—A nat. ord. of dicotyledonous plants, composed of trees, shrubs, and herbs, with alternate, or nearly opposite, exstipulate leaves. They are found in various parts of the world, as Europe, Asia, America, and New Holland. The genus *Santalum* is the type. The species are natives of Asia, the tropical parts of Australia, and the islands of the Pacific Ocean, and consist of trees and shrubs. Two species of santalum are valuable as furnishing the wood known in commerce by the name of sandal wood. The wood, however, which is known by the name of red sandal wood, and which furnishes a valuable dye, is the produce of a totally different plant. See PTEROCARPUS. The white sandal wood, *Santalum album*, is a native of Malabar, on the mountainous parts of which it grows as a large tree with a fine spreading cyme. This tree yields the white sandal wood of commerce, whilst another species, which is a native of the Sandwich Isles, the Fijis, and Moluccas, *S. Freycinetiánum*, yields the yellow sandal wood so much esteemed in China. This tree forms almost the only export of any commercial value of the Sandwich Isles, about 400 tons being annually exported to Canton. The wood of both these trees is strongly aromatic, and is much used in China by cabinetmakers. A perfume is obtained from it which is in almost universal use amongst the Chinese. It is also much esteemed by them as a medicine. The yellow sandal wood is preferred as being most fragrant. In their temples it is used as an incense, being burned before their idols. What are commonly called by Europeans *Joss-sticks*, are made of fine raspings of this wood worked into a paste with rice water, and spread upon slender sticks. These are in universal use, and are kept constantly burning in all their temples, private houses, ships, and boats.

Santalum. *The Sandal Wood Tree.*—See SANTALACEÆ.

Saperda.—A genus of beetles. See CERAMBYCIDÆ.

Sapindaceæ. *The Soap-wort family.*—A nat. ord. of dicotyledonous plants, composed of trees or shrubs, sometimes climbing herbaceous plants, with alternate, sometimes opposite, compound, rarely simple leaves, often marked with lines or pellucid dots. They are, for the most part, natives of South America and India. This order contains many plants, possessing various properties, owing to the existence of bitter and astringent substances in their composition, and sometimes associated with a resin and a volatile oil. The fruits of some are poisonous, whilst others are edible. Some of the species of *Paullinia* are poisonous, whilst from the seeds of one, *P. sorbilis*, a kind of bread, called the guarana bread, is prepared in Brazil. This substance contains a principle identical with caffeine. Two species of *Nephelium*, *N. longan*, and *N. litchi*, yield the excellent Chinese fruits called the longan and the litchi. The horse chestnut belongs to this family. See AESCHYLUS. The genus *Sapindus*, however, is the type of the family, and is remarkable for containing a large quantity of a saponaceous principle. The species are trees which are spread over the whole intertropical zone. The leaves are without stipules, the flowers are small, white, or greenish-white, and the berries are red and saponaceous, and are used in many countries for washing woollens and cloths of various kinds. One of the most remarkable species of this kind is *S. saponaria*, a middle-sized tree growing in the West Indies, and the continent of America. The berries, which are about the size of a cherry, are known by the name of soapberries. The fleshy part of these berries is viscid, and when rubbed down in water forms a good lather. From the seeds an oil is obtained which is edible, and is likewise used for burning. The bark and root are astringent, and have been recommended as tonic bitters. In the East Indies several other species occur, possessing the same saponaceous berries. They are called reetha, and in their dried state may be bought in every bazaar, and are everywhere employed as a substitute for soap.

Sapindus (*sapo*, soap; *indicus*, Indian). *The Soap-wort.*—A genus of plants belonging to the nat. ord. SAPINDACEÆ.

Saponaria (*sapo*, soap). *Soap-wort.* — A genus of plants possessing a saponaceous principle. See CARYOPHYLLACEÆ.

Saponite. *Soap-stone.* — A synonym of STEATITE.

Sapota. — A synonym of *Achras.*

Sapotaceæ. *The Sappodilla family.*—A nat. ord. of dicotyledonous plants, composed of trees and shrubs abounding in a milky juice, with alternate, exstipulate, entire, coriaceous leaves, and natives of the greater part of India, Africa, and America. The bark of some of the species is bitter and tonic, and their fruits edible, as the sappodilla plum, a species of *Achras.* The seeds of others yield a thick oleaginous substance like butter — see BASSIA; and the milky juice with which some of the species abound, contains elastic matter, as the gutta percha. See ISONANDRA.

Sapphire.—A precious stone. See CORUNDUM and ADAMANTINE SPAR.

Sapphirina.—A genus of entomostracous *Crustacea.* See CYCLOPIDÆ.

Sarcina.—A genus of acotyledonous plants belonging to the nat. ord. *Algæ. S. ventriculi* is a microscopic alga which appears to inhabit the human stomach. It has frequently been discovered in matters vomited by sick persons, and seems to be connected with a diseased state of that organ, but more as a result than a cause of the disease itself.

Sarcinula.—A genus of corals belonging to the family *Madrephyllicea.* It contains only a few species which are found forming a solid mass composed of a number of tubes united together. The tubes, unlike those of *Tubipora*, are furnished with radiating star-shaped lamellæ in the interior. They are numerous, cylindrical, parallel, vertical, and united together in a bundle by intermediate transverse partitions. The typical species, *S. perforata*, is a native of the Southern Ocean, and forms a large, flat, stony mass of aggregate parallel tubes resembling the honeycomb. These tubes are straight, nearly contiguous, and they are striated and open.

Sarcode.—A term used by microscopic writers to denote the gelatinous, homogeneous, diaphanous, proteine substance occurring abundantly in very young animals, as the larvæ of insects, embryos of the vertebrata, worms, zoophytes, &c. It appears to constitute the whole of some of the lower animals, especially the infusoria and rhizopoda, as the *Amibæ*, &c. It may be readily seen upon placing any of the infusoria between two plates of glass and applying very gentle pressure.

Sarcodictyon.—A genus of zoophytes. See ANTHOZOA.

Sarcophaga (σαρξ, flesh, φαγω, to eat).—*The Flesh-fly.* See MUSCIDÆ.

Sarcophilus (σαρξ, flesh; φιλεω, to love). —A synonym of *Dasyurus.* See DASYURINÆ.

Sarcoptes.—A genus of *Acari*, one of the species of which produces the disease called the itch. See ACARIDÆ.

Sarcoramphus.—A genus of vultures containing the condor. See VULTURIDÆ.

Sardonyx.—A precious stone. See AGATE.

Sargassum (*sargazo*, the Spanish word for sea-weed).—A genus of *Fuci*, containing the species well known as the gulf-weed. See THALLOGENÆ.

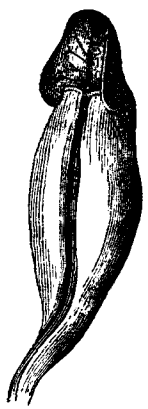
Sargus.—A genus of acanthopterygious fishes belonging to the family *Sparidæ.* The species described amount to about sixteen, and are characterized by having several rows of round molar teeth, and sharp cutting or conical incisorials in front. They feed in general on shells and the smaller crustacea, which their round molar teeth are well calculated for crushing. Some also feed upon fuci. The best known species is an inhabitant of the Mediterranean, and was well known to the ancients. This fish, *S. Rondeletii*, has been described by some of the older writers as possessing a lively passion for goats, swimming towards them with great rapidity, and indulging before them, as they move along, in playful gambols. The male is asserted also to be polygamous, and to fight with the greatest fury for the possession of many females. Another species, *S. ovis*, a native of the American seas, and called by the inhabitants the "sheep's head," is highly esteemed for the excellent quality of its flesh. It is so much valued for the table at New York, that in the market its price varies from a dollar to a dollar and a-half for a middle-sized individual, and for those of a large size the price ranges from £4 to £7 sterling! The fishing of this species forms an object of importance along the coasts of the State of New York. As they swim in troops, many hundreds are sometimes taken at a single cast of the net. When taken they are immediately packed in ice, and despatched, during the cool of the night, to the markets of New York. It is said to be very difficult to take this fish with a hook and line, as it snaps the very hooks asunder with its strong cutting teeth.

Sarmaticus.—A genus of shells. See TURBINIDÆ.

Sarothamnus (σαρος, a broom; θαμνος, a branch).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ.* To this genus belongs the common broom, *S.* (*Cytisus*) *scoparius*, or *Spartium scoparium*, the only species found in Britain. It is a very abundant one, however, and is equally common in various other parts of Europe, where it serves many useful purposes. Brooms and besoms are made of the stems and branches, and from its bark is obtained a fibre used as a thread. All parts of the plant contain a yellow dye, which has been used from an early period. In the southern parts of Europe, the flowers are eaten by the natives as a salad; and in the north the young buds are pickled, and form a substitute for capers. The plant is also useful in tanning, and

broom tops are employed as a popular remedy in cases of dropsy. Sheep are very fond of the broom, and it is a curious fact that the pods, which they greedily devour, produce in them a sort of intoxication. They lie down and appear unable to walk, but it soon passes off, and leaves no inconvenience behind.

Sarraceniaceæ.—*The Water Pitcher*, or *Side-saddle family.* — A nat. ord. of dicotyledonous plants, composed of herbs growing in marshy places in North America, and of a peculiar growth. The leaves are all radical, and the petioles are folded, and cohere together in such a manner as to form hollow vases or pitchers (*ascidia*) of a greater or less length, on the top of which is placed the lamina or blade of the leaf, which acts like a lid, though it is not articulated to the pitcher as in *nepenthes*. Internally the pitcher is



Leaf of *Sarracenia.*

furnished with hairs directed downwards, and a number of small glands which secrete a fluid that is often found in considerable quantity at the bottom. From the midst of these leaves spring one or more stems, each terminated by, generally, a single flower, rarely two or more, of a red, yellow, or white colour. *S. purpurea* may be taken as the type, a common species which may be met with extending from Hudson's Bay to Carolina. The leaves or pitchers of this and other species, act as regular traps for insects. Advantage of this is taken in Carolina to rid a house pestered with flies. These insects are attracted to the leaves in a wonderful manner, and if a plant is placed within a house, or suspended from the ceiling, they flock to it in great numbers. Entering the neck of the pitcher, they cannot withdraw themselves, owing to the hairs within the tube which point downwards; they are thus fairly imprisoned till they die.

Sarsia.—A genus of small *Medusæ*, named after M. Sars, the learned zoologist, who first described the species upon which the genus is founded. *S. tubulosa* is a native of the coasts of Norway, and presents the appearance of a semi-spherical umbel in the shape of a bell, excavated underneath, and with four very long attenuated tentacles. The umbel is about eight or nine millimeters high, and the peduncle which springs from its under side is very long, tubular, and swollen at the extremity. It has been found on the British coasts also.

Sassafras.—A genus of plants. See LAURACEÆ.

Saturnia.—A genus of moths. See BOMBYCIDÆ.

Satyridæ.—A family of diurnal lepidopterous insects, composed of numerous species of butterflies, of a moderate size, generally of a more or less sombre colour, and marked with ocelli on their wings. They are spread over all the world, living in dry situations, and generally flying low.

Satyrus.—A genus of butterflies belonging to the family *Satyridæ*, and synonymous with HIPPARCHIA.

Saura (*σαυρος*, a lizard). *The Lizards.*—An order of animals belonging to the class *Reptilia*, section *Squamata*, or scaly reptiles. The characters of this order, are—body elongate, rounded, and covered with imbricated or granular scales; tail elongate, tapering, rarely prehensile, generally covered with whirls of scales; limbs four, but occasionally in such a rudimentary state as to be hidden under the skin, and giving the animals the appearance of having none; toes clawed; ribs distinct, moveable, and with a distinct sternum; mouth not dilatable, jaws toothed, the lower jaw bones being united by a horny suture in front; eye generally with distinct eyelids; drum of the ear generally distinct, exposed; eggs with a hard skin or shell; the young not undergoing any metamorphosis. The genera and species included in this order of reptiles are very numerous. To it belong the monitors, MONITORIDÆ; the true lizards, LACERTINIDÆ; the CHALCIDÆ; the skinks, SCINCIDÆ; the geckos, GECKOTIDÆ; the iguanas, IGUANIDÆ; the chameleons, CHAMELEONIDÆ; and many others.

Saurothera.—A genus of birds allied to the cuckoos. See CUCULIDÆ.

Saururæ.—A family of dicotyledonous plants nearly allied to the peppers. The species are herbs which grow in the fresh waters or marshes in the temperate parts of North America and Asia. The fruit is contained in a capsule, is very small, and resembles the pepper; various other parts of the plant contain acrid qualities similar to those of the *Piperaceæ*.

Saurus.—A genus of fishes, containing amongst others the species known in India as the "Bombay duck," or "Bummelow." See SCOPELIDÆ.

Saussurite.—A mineral, called also jade, or tenacious jade, and axe-stone. It is of a green or grayish-white colour, and pearly lustre. It is

very tough. Specific gravity 2·801; hardness 7. It is found along with diallage at the Lizard, Cornwall, but was first discovered by Saussure, after whom it is named, on the edge of the lake of Geneva. Saussurite is composed of silica, alumina, oxide of iron, a little protoxide of manganese, with lime, magnesia, and a trace of potash.

Saxicava (*saxum*, a stone; *cavo*, to excavate).—A genus of conchiferous *Mollusca*, nearly related to the *Myidæ*, or, according to some arrangements, forming the type of a small family by itself, *Saxicavidæ*. There is only one species of the genus known, but its protean form has caused conchologists to make at least two genera of it. When young the shell is symmetrical, with two small teeth in each valve. In this state it is the *Hiatella* of authors. When it is full grown it is rugose and toothless, forming the true *Saxicava*. *S. rugosa* is found in almost all parts of the world, and as it is also found in various situations, living in crevices of rocks and corals, or amongst the roots of sea-weed, in which places it is attached by a byssus, or boring into limestone and other rocks, and into other shells, it assumes so many forms that no fewer than fifteen species have been manufactured out of its varieties and conditions. It ranges from low water to 140 fathoms, and appears to attain its largest size in the arctic seas. It occurs also in a fossil state in the miocene formations, and in all the glacial deposits. The means by which bivalve shells perforate stone and timber has been the subject of much inquiry, and no small amount of writing has been occasioned by it. The prevailing doctrine, perhaps, at present is, that it is by mechanical means the effect is produced—that is, by the shell itself and by the foot of the animal combined. In the case of *Saxicava*, however, this mechanical action is more problematical. Unlike the rough rasping shell of *Pholas*, this little mollusc has its shell smooth and covered with an epidermis, and its foot is so small and finger-like that it possesses none of the power enjoyed by the foot of the *Teredo*. It has, accordingly, been supposed by some conchologists that it dissolves the rock by chemical means, softening it so with some peculiar acid it has the power of secreting, as to be able to wash the debris away by means of a current of water passing through the branchiæ. By others it is asserted that the anterior margins of the mantle, which are united and much thickened, are covered with siliceous particles, and form a rasping surface sufficiently powerful to wear the rock away.

Saxicola (*saxum*, stone; *colo*, to inhabit).—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, family *Luscinidæ*, and sub-family *Luscininæ*. The typical species is the wheatear, *S. œnanthe*. This pretty little warbler has a very wide geographical distribution. It is abundant all over Europe from Lapland to the shores of the Mediterranean, and is met with on the shores of Asia Minor. It arrives in this country early in spring, and is very common on our downs and sheepwalks. It is of a brownish colour, with the rump and tail white, and is about six or seven inches in length. Its nest is generally placed under a clod of earth, under a stone, or in a deserted rabbit burrow, or in a gravel pit. At the time of their departure, in the latter end of August and September, the wheatears are often to be seen in considerable numbers near the sea shore, where they seem to reside for a short time previous to their departure. They are very much esteemed as an article of food, and on St. James's day, 25th July, the shepherds on our downs begin to lay traps for them. They are chiefly taken with a noose made of horse hair, and it is extraordinary the numbers so taken. One shepherd has been known to capture eighty-four dozen in a day. They are roasted, wrapped up in vine leaves on account of the great tenderness of the flesh, and their flavour is so delicious and their fat so abundant, that they are called, not inaptly, the English ortolan. The stone-chat, *S. rubicola*, and the whin-chat, *S. rubetra*, belong to this genus. Both these birds are summer visitors, and breed in Great Britain. Their nests are formed of dry grass stalks and moss, and are built on the ground. Their song is short and pleasing.

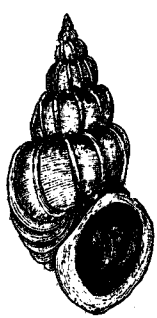
Saxifraga (*saxum*, a rock; *frango*, to break). *The Saxifrage*.—See SAXIFRAGACEÆ.

Saxifragaceæ. *The Saxifrage family*.—A nat. ord. of dicotyledonous plants, composed of shrubs, trees, or herbs, with alternate or opposite, usually exstipulate leaves. They are generally natives of temperate climates, and some of them are characteristic of alpine districts. The *Escallonieæ* are evergreen shrubs, with alternate, simple, exstipulate leaves, and are natives of the temperate regions of South America, being often found at a great elevation. The *Cunonieæ* are trees or shrubs, with opposite leaves, having interpetiolary stipules; and are found in South America, the East Indies, South Africa, and Australasia. The *Hydrangeæ* are shrubs with opposite, sometimes whorled, exstipulate leaves, and flowers, frequently cymose, with the exterior flowers sterile and dilated. They are found chiefly in the temperate parts of Asia and America. See HYDRANGEA. The *Saxifrageæ*, containing the true saxifrages, are herbs with alternate, usually exstipulate leaves, and grow in the mountainous parts of Europe, &c. The genus *Saxifraga* is the type of the family, and gives its name to the whole order. They are most of them true rock plants, and send forth their roots between the crevices of the rocks on which they grow. They are pretty well known flowers, and no fewer than twenty-four species are British. *S. umbrosa* is the plant so generally known under the names of London-pride and none-so-pretty. It is found growing on the hills of Spain, and is also a native of Great Britain and

Ireland, in which latter country it is called St. Patrick's cabbage. *S. longifolia*, a native of the Pyrenees, is a fine handsome plant, and forms a great ornament to our gardens.

Scabiosa (*scabies*, the itch).—A genus of dicotyledonous plants belonging to the nat. ord. *Dipsaceæ*. The species are perennial, or suffruticose herbs, with variable leaves, growing in many parts of Europe and Asia, and a few at the Cape of Good Hope. Their flowers are collected into terminal heads, surrounded with a many-leaved involucrum. Several species are very common in our meadows and waste places. *S. succisa* is exceedingly abundant, and is well known by the name of "devil's bit." Its Latin specific name, as well as this, its English one, are derived from the fact, that its root is always truncate, as if it had been bitten off. And in times of superstition it was fabled, that the devil, for the hatred he bore to the human race, had bitten off the root because it contained many singular virtues. It is slightly astringent, and an infusion of it is bitter but not unpleasant. In Sweden they obtain a green dye from the leaves. Several species are cultivated as ornamental plants.

Scalaria (*scala*, a stair). *The Wentletrap.*—A genus of sessile-eyed or ediophthalmous gasteropodous *Mollusca*, forming the type of a small family, *Scalariidæ*, the animals of which have their teeth arranged in numerous longitudinal series. In most of the species the shell is pure white, and lustrous, of a turreted form, many-whirled, and ornamented with numerous transverse ribs. The whirls are sometimes separate, or only united to each other by the projections of the ribs. The mouth is circular, and the peristome continuous. The animal is provided with an operculum, which is of a horny texture, and few-whirled. The species are numerous, about 100 recent ones having been described, and range from low water to eighty fathoms.



Scalaria pretiosa—The Wentletrap.

When disturbed the animals exude a purple fluid. Several species are natives of the British and other European seas, but the most beautiful are natives of hot climates. One of these was for a long time reckoned very precious, and has in consequence been named *S. pretiosa*. It is a native of the Chinese seas, and not a great many years ago was esteemed one of the most valuable shells the conchologist could boast of. A single specimen has sold for the enormous price of 2,400 livres or 500 florins. Similar specimens, or even better, may now be had for a few shillings. The shells of another species, a native of California, are collected by the Spaniards at San Blas to form ear-rings. They are called *caracoles finos*.

Scalops (*σκαλλω*, to dig). *The Water Mole.*—A genus of fossorial animals belonging to the order *Ferœ*, and family *Talpidæ*. The species upon which the genus is founded, *S. aquaticus*, or *Canadensis*, represents in North America the mole of Europe. It is of an elongate, cylindrical form, about six inches long, with a depressed elongated muzzle, and a nearly naked tail. It burrows like the mole, but lives near the banks of rivers. It is a native of the United States, from Canada to Virginia.

Scalpellum.—A genus of cirrhipedes. See LEPADIDÆ.

Scansores (*scando*, to climb).—The name of an order of birds, whose feet are peculiarly adapted for climbing. For this purpose they have the power of turning one of the front toes backwards, so as to oppose two hind toes to the two front ones. They walk with difficulty on the ground, and their powers of flight are usually moderate. The greater part of their time is passed on trees. The order includes the families PSITTACIDÆ, or parrots; RAMPHASTIDÆ, or toucans; PICIDÆ, or woodpeckers; and CUCULIDÆ, or the cuckoos.

Scaphites (*σκαφη*, a boat).—A fossil genus of cephalopodous mollusca. See AMMONITIDÆ.

Scaphula (*scaphula*, a little boat).—A genus of conchiferous mollusca belonging to the family *Arcadæ*. Unlike the other species of this family, which are all marine, the shell upon which this genus is founded is a native of fresh water. It is found in the Ganges and its branches, from Calcutta to Humerpoor on the Jumna, 1,000 miles from the sea.

Scapularies.—A word used in ornithology to designate those feathers which take their rise from the shoulders of birds, and cover the sides of the back.

Scarabæidæ.—A large family of pentamerous *Coleoptera*, belonging to the group *Lamellicornes*. They possess antennæ, terminated in the majority by a club, composed of leaflets capable of being shut up, and in the others consisting of box-like joints, either in the form of a cone reversed, or nearly globular. The mandibles are alike, or nearly alike, in both sexes, but the head and thorax of the males often exhibit prominences of peculiar form; sometimes also their antennæ are more developed. The species are very numerous, about 3,000 having been enumerated,

distributed throughout 200 genera. Their masticatory organs, antennæ, and habits of living, are varied, in consequence of which this immense group is now subdivided into several distinct families. The first of these is the *Copophragi*, dung-feeding beetles, or *Scarabæidæ* proper. This family comprises those beetles which live habitually in, and feed upon, excrements. The greater number are found in the dung of herbivorous animals, though a number live even in human excrement. Their forms are very varied, but generally short and stumpy, and their general appearance is far from being so repulsive as one might suspect from the nature of their food, being, for the most part, of a shining black, or in many instances being clothed in bright metallic colours. In order to preserve their lustre, they are able to secrete an oily fluid which prevents the matters amongst which they live from sticking to their bodies. They are able to dig into the ground very rapidly, when the substance in which they are found is disturbed, and thus disappear very quickly. These insects have been called *Pilulaires* from the habit they have of enclosing their eggs in little balls of dung, which the females roll along, with the assistance of the males, until they reach the hole in which they are to be deposited. The type of this family is the sacred beetle of the Egyptians. See ATEUCHUS. The second family, the *Arenicoli*, contains those species in which the elytra entirely cover the abdomen. They live in excrementitious matter like the former, and dig deep burrows in the earth; they fly about in the twilight after sunset, and counterfeit death when alarmed—as the GEOTRUPIDÆ and *Trogidæ*. The third family is that of the *Xilophili*, and contains those species, the males of which have the head or thorax armed with peculiar horns or tubercles, such as the rhinoceros beetles—as the DYNASTIDÆ and *Rutelidæ*. The fourth family, *Phyllophaga*, contains a number of beetles known as chafers or chaffers, and which are arboreal feeding on the leaves of trees—see MELOLONTHIDÆ. The fifth family, *Anthobiæ*, contains species which live upon leaves and flowers—as the *Glaphyridæ*. The sixth family, the *Meletophili*, are likewise beetles which live upon the juices of flowers—see CETONIIDÆ.

Scarabus.—A genus of land shells. See AURICULIDÆ.

Scaritides.—A sub-family of coleopterous insects belonging to the large family *Carabidæ*. They are distinguished from the other group of carabidæ by having the elytra separated from the lunate thorax by a considerable space, which causes them to appear pedunculated, and being rounded at the extremity. The tibiæ of the fore legs are broad, and very much dentated or palmated, by means of which the insects are enabled to burrow in the earth or sand. They are for the most part found under stones, and in holes in the ground near water, or upon the sea shore. They appear to be nocturnal in their habits, and their colours are for the most part black or obscure. The larger species are chiefly inhabitants of the New World, and some of the largest are comprised in the genus *Scarites*, which may be taken as the type of the sub-family. One species occurs in Britain.

Scarus.—A genus of fishes briefly mentioned under the article LABRIDÆ. It belongs to the order *Pharyngognathi*, and is now placed in the family *Cyclo-Labridæ*, and contains about ninety known species. The species resemble those of the genus *Labrus* in general appearance, but differ from them in the form and structure of their teeth. The jaws resemble those of the genus *Tetraodon*, each being divided into halves by a medium suture. The teeth are incorporated with the bone of the jaws, and shine through the glazed surface in crowded quincuncial order. The oldest form the cutting border of the jaw, and as they are worn down are succeeded by lower ranks, new pulps developing at the base of the jaw to keep up the succession. A species of *Scarus* was well known to the ancients, and held in high repute by them. It was said to be a very prudent fish; skilful in withdrawing other fishes from the nets in which they were enclosed, drawing them out from the meshes by the tail, and if a companion was caught by a hook it was most active in endeavouring to cut the line. Aristotle asserted that it had the power of ruminating, and others maintained that it possessed a distinct voice. The Roman epicures esteemed it highly as a delicious fish, the flesh being considered tender, agreeable, sweet, and easy of digestion, and the intestines especially were parts in high repute. Their poets said of it that its very excrements were of such delicacy that the gods themselves were unwilling to reject them. In the present day the scarus of the archipelago is considered to be a fish of exquisite flavour, and the Greeks still name it *Scaro*, and eat it with a sauce made of its liver and intestines. Its food consists of seaweed, and it is thought by some that the necessity there is for masticating its food well, working it for that purpose backwards and forwards in the mouth, may have given rise to the idea that it ruminated.

Scelidotherium (σκιλις, leg; θηρ, wild beast).—A genus of extinct animals belonging to the same family as the *Sloths*. The only species, *S. leptocephalum*, was first made known to naturalists by portions of its skeleton having been discovered by Mr. Darwin in Northern Patagonia, at *Punta Alta*. From the remains now in the British Museum, it is evident this scelidothere must have been a quadruped from eight to ten feet in length, but not more than four feet high, and nearly as broad at the haunches, the thigh bones being extraordinarily broad in proportion to their length. The limbs were provided with long and strong claws. It is believed to have had a long and muscular tongue, and it is probable that its food was rather of a mixed

nature, though still it was more essentially related to the sloths than to the ant-eaters.

Schistocephalus (σχιστος, cleft; κεφαλη, head).—A genus of *Entozoa* or intestinal worms belonging to the order *Cestoidea*, and family *Tæniidæ*. The species of worm upon which the genus was founded lives in the abdomen of some fishes, as the *Gasterosteus*, &c., during the first stage of its existence, becoming fully developed only after it has been taken into the stomach and intestines of birds which feed upon the fishes.

Schorl.—A mineral substance found in Cornwall, and forming an ingredient in the rock called cockle. It is a black variety of tourmaline. See this word.

Sciæna.—A genus of acanthopterygious fishes belonging to and forming the type of the family *Sciænidæ*. In general form they resemble the perches. The best known species is the maigre, *S. aquila*. This fish attains a considerable size, being often five or six feet long, and is of great strength. It is occasionally found on our coasts, but is a native of the southern seas of Europe.

Sciænidæ.—A family of acanthopterygious fishes, possessing many of the external characters of the *Percidæ* or perches, but differing in this respect that they have no teeth on the vomer or palatines. The bones of the head and face are often full of muciferous cells or hollows, with external porous openings, and the face and snout are frequently gibbous. Many of the species possess curious air bladders, which are fringed with branching appendages. The family contains twenty-three genera, and are represented by SCIÆNA, UMBRINA, and FOGONIAS, &c. See these words.

Scilla.—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*, and composed of bulbous-rooted plants, which grow in various parts of Europe, and at the Cape of Good Hope. The flowers are terminal, disposed in bunches, of a white or blue colour, accompanied with bracteæ. Several species are cultivated in gardens as ornamental plants, and others are useful for their medicinal virtues. *S. Peruviana*, the hyacinth of Peru, is one of the most ornamental species. It is a native of the south of Europe, of Algiers, and Tunis, and not, as its name would imply, of Peru. Its flowers are large, and of an azure-blue. *S. maritima* (*Urginea maritima*) supplies the well known medicine called *Squill*, and is the most powerful in its medicinal effects of all the species. This plant grows on the sandy coasts of the Mediterranean, and its bulbs are often nearly the size of a man's head, and weigh four or five pounds. In their fresh state they are very acrid; and contain a bitter crystalline principle called scillitine. Squills are used extensively in practice, in cases of coughs as an expectorant and diaphoretic, in cases of dropsy as a diuretic, and as an emetic.

Scincidæ. *The Skinks.*—A family of scaly reptiles belonging to the order *Saura*. This family contains many species, which are characterized by having a shielded head like the true lizards, but the body, tail, and limbs covered with uniform enveloping scales, which are generally smooth and polished. They have distinct eyelids. The back is rounded, and has neither crest nor spines. The neck is about as thick as the rest of the body, and in general the whole body of the animal, from the head to the tail, is nearly of equal size; so that in those species which have no feet, as in the genus *Anguis*, their appearance approaches very much to that of a serpent. The tail is generally of a conical form, and, with one exception, has neither crest nor spines. The feet are generally short and ill formed. In some of the genera they have four, in others there are only two visible, and in others, again, even these are merely rudimentary, or not visible externally. The genus *Scincus* is the type of the family. The species possess four feet, well formed, but short, and furnished with five toes, fringed on the sides. The body is fusiform, and nearly cylindrical, and covered with scales, which are uniform, shining, imbricated, separate from each other, and disposed like the tiles of a house. The head is small, generally quadrangular, and the muzzle is sharp-edged. The jaws are furnished with small, close set teeth, and in some of the species the palate is armed with a double row, while the tongue in many is covered with scaly papillæ. The typical species is *S. officinalis*. This animal, the common skink, is from six to eight inches long, and the body is covered with round, smooth scales, broader than long, and disposed in longitudinal rows. The muzzle is sharp pointed, which enables it to bury itself with facility in the sand of the deserts which they inhabit. The tail, thick at its base, slender and compressed at its extremity, and wedge-shaped, is shorter than the body. The body is of a silvery-yellow colour, with seven or eight black bands running across it. This animal is a native of Africa, being found in Nubia, Abyssinia, Egypt, and Arabia. It is met with also in Senegal, and on the coast of Barbary, and on the European side, in Sicily, and several of the islands of the Grecian archipelago. It lives upon insects, is generally seen on little sand hills, basking in the sun; but if disturbed, runs away immediately, and rapidly buries itself in the sand. The Arabian physicians used to regard the skink as a specific against all sorts of maladies; and it was considered a valuable remedy in cases of wounds from poisoned arrows.

Scirpus.—A genus of monocotyledonous plants belonging to the nat. ord. *Cyperaceæ*. It is composed of herbs, growing in marshy and inundated ground, and distributed generally over the globe, some of the species being found growing in all sorts of climates. Their stems are naked or leafy, and the leaves, when present, are linear, canaliculate, or setaceous. The most

characteristic species of the genus is *S. lacustris*, the bulrush, a plant growing in lakes and ponds, &c., in all the temperate parts of the globe, and rising to the height of from four to six feet. The stems are cylindrical, and filled with a spongy, cellular tissue. These are employed for various purposes, as litter for cattle, thatching cottages, seating chairs, and other domestic purposes. *S. tuberosus* is a native of China. Its root is tuberous; and as the tubers are eatable, the Chinese cultivate the plant extensively. It is called by them "pi-tsi, pu-tzai, or pe-ti," which signifies the "water chestnut."

Scissurella (*scissura*, a cleft).—A genus of minute gasteropodous *Mollusca* belonging to the family *Haliotidæ*. The genus is characterized by the shell having a rounded aperture, with a slit in the margin of the outer lip. Five recent species are known, all European, and four fossil in the miocene.

Sciuridæ.—A family of rodent animals belonging to the order *Glires*, and embracing the various animals known by the name of squirrels. In the animals of this family the head is rather broad, the frontal bone being dilated into a post-orbital process. The eyes are large and prominent; fore feet with four toes, hind, five; tail more or less lengthened, generally very hairy, expanded in the arboreal species, and very bushy in the terrestrial. Some of them have the skin of the body extended between the limbs. For the most part they are lively, agile animals, and their geographic range is very wide, both in the Old and New World, though as yet none have been discovered in Australia. They may be divided into two groups—those with free limbs

Sciurus vulgaris—Common Squirrel.

and those with their limbs invested in the skin of the sides. These latter are generally known by the name of flying squirrels. See PTEROMYS. The former consist of the true squirrels and the ground squirrels, &c. The genus *Sciurus* contains the true squirrels, and may be considered the type of the family. They have a large, broad, depressed tail, and live in trees. The common squirrel, *S. vulgaris*, is a remarkably neat, lively, active, and provident little animal. It never leaves its food to chance, but secures in some hollow tree a vast magazine of nuts for winter provision. In summer it feeds upon the buds and young shoots, and is particularly fond of those of the pine and also the young cones. The squirrel is found generally throughout Europe and in the north of Asia, and, including the tail, measures fourteen inches in length. Two or three species are found in North America, the gray squirrel, *S. cinereus*, being found in nearly the whole of the United States, but most abundantly in Pennsylvania and the Carolinas; and the black squirrel, *S. niger*, being found on the northern shores of Lakes Huron and Superior, and on the eastern sides of the Rocky Mountains. These two squirrels are eaten by the natives, and are said to make excellent pies. The largest of all the true squirrels is the Malabar squirrel, *S. purpureus* or *maximus*, a native of India, and about thirty-three inches long. It lives in palm trees, and is said to be very fond of the milky juice of the cocoa nut, as well as of the solid part of the nut. The ground squirrels, *Tamias*, burrow in the ground in woody districts, or near the roots of trees. They never make their nests in the trunks or branches of trees, like the true squirrels, but climb with ease, speedily making their way, when disturbed, from one branch to another. The nest is reached by a winding tunnel, and there are generally two or three lateral chambers for the stowage of winter food. The tamias have cheek pouches opening into the mouth. *T. striatus* is the Asiatic species, and is about nine inches long. *T. Lysteri* is the American species, and resembles the former so much, that by some zoologists they are considered identical.

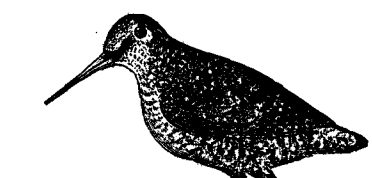
Sciuropterus (*sciurus*, squirrel; πτερον, wing).—A genus of flying squirrels. See PTEROMYS.

Sclerogenidæ. *Mailed Cheeks.*—An extensive family of acanthopterygious fishes, composed of the Linnæan genera, *Trigla*, *Cottus*, and *Scorpæna*; and synonymous with the family TRIGLIDÆ, which see. The distinctive character of this group is the prolongation of the second suborbital scale-bone across the cheek, to be articulated with the pre-operculum in its curve so as to serve for a fulcrum to the spine, which issues from the angle of that bone. The species of which this large family is composed offer a great variety of form. Some are beautiful fishes splendid in colours, elegant in general appearance, and graceful in the form of their fins. Others are remarkably ugly, having a disagreeable shape, and loose, disgusting skins. See TRIGLA, the gurnards; DACTYLOPTERUS, the

flying-fish of the Mediterranean; APISTES; GASTEROSTEUS, the sticklebacks; COTTIDÆ, the bull-heads; SYNANCEIA, &c.

Scolopacidæ. *The Snipe family.*—A family of birds belonging to the order *Grallæ*, and characterized by having a long, slender, and feeble bill, provided with a very peculiar distribution of nerves, which render its exterior sensitive, especially towards the tip, the membrane of which is fleshy. They are all more or less migratory in their habits, breeding in high latitudes; and their powers of flight are considerable. This family contains a great many species, which have been distributed throughout several sub-families. Amongst them are—I. The godwits, *Limosinæ*, which have a long bill, with the culmen rounded, and the tip of the upper mandible extending a little beyond that of the lower, the nasal groove reaching three-fourths of the length of the bill. These birds are found migrating, according to the season, to various parts of the world. Their food consists of small molluscous animals, worms, &c. The godwits undergo a double moult, which changes nearly entirely the colour of their plumage. The common godwit, in consequence, has been described as two or three species, according to the state of the plumage. In the winter plumage it is the *Limosina melanura;* in the young state, before the first moult, it is the *L. rufa;* and in its nuptial plumage, it is the *L. ægocephala* of authors. This bird is found over the whole of the European continent, and in this country is most frequently seen in spring and autumn. It breeds in high northern latitudes for the most part, but occasionally in England. The godwits reside in fens and marshes, but seldom remain more than two or three days in the same place. When pursued, they run with great speed, and scream as they rise. Their flesh is said to be excellent. The curlew, *Numenius arquatus*, is a well known inhabitant of these islands. It has a very wide geographical range; it is equally diffused from the sultry portion of the torrid zone to the frozen countries of the north. It is found in Australia and the islands of the Pacific Ocean; and specimens have been brought to this country from China, Nepâl, and South Africa. In Scotland it is well known as the whaup. II. The gambets, *Totaninæ*, have the bill as long as the head, with the nasal groove extending half the length of the bill; the tip of the upper mandible projecting over the lower mandible, and their hind toe barely touching the ground. They search for worms, insects, and molluscous animals, among the gravel and stones of the banks of lakes and rivers. Others seek the sea shores of various parts of the world. The largest European species, *Totanus glottis*, the greenshank gambet, is nearly the size of the godwit, and is a visitor to Great Britain. It breeds on the margins of lakes, and during the season of propagation is very clamorous, rising on the wing, and spreading an alarm, at the approach of danger, to all other birds within hearing. In winter it resorts to the sea shore in small flocks. An American species, *T. melanoleucus*, is known to sportsmen in that country by the name of "the tell-tale," and is detested by them for its vigilance in alarming the ducks with its loud and shrill whistle, on the first glimpse of the gunner's approach. Its whistle consists of four notes, rapidly repeated, and is so loud shrill, and alarming, as instantly to arouse every duck within its hearing. In the fall, when they are fat, their flesh is highly esteemed, and many of them are brought to market. One species which is occasionally found in Britain, *T. Glareola*, the delicate wood gambet, is remarkable for the extraordinary length of its legs. It breeds in the marshes, and may be seen tripping across the broad floating leaves of aquatic plants with grace and agility. III. The avocets, *Recurvirostrinæ*, have the bill long and slender, their legs very long and slender, with the toes short, and the outer ones webbed at the base. See RECURVIROSTRA. IV. The sandpipers, *Tringinæ*, have the bill usually as long as the head, with the tip depressed, and the nasal groove very long; their toes slightly bordered, and not united at the base. They inhabit various parts of the world, seeking their food on the sea shores and in marine marshes. Some frequent the margin of lakes and rivers of the interior; their food consists of worms, insects, and small molluscous animals. Their moderately elevated legs and abbreviated form impart a heavier carriage than that of the godwits. A number of species are found, more or less regularly, on the British shores. One of the most common is the knot sandpiper, *Tringa canutus* or *cinerea*, which is about the size of a snipe, and ashy-gray above, white below, with some dusky spots on the breast in winter, suffused with bright ferruginous in the spring. It occurs in large flocks during the seasons of passage and through the winter, retiring farther north to breed. It is one of the most delicious of birds, and when fattened, is highly esteemed by epicures. The little sandpiper, *T. minuta*, is considerably smaller than the knot, and has a short bill. These active little birds take their food along the margin of the sea, following each retreating wave. When in considerable flocks, and in their winter plumage, they show alternately their gray upper parts and white under surface, as they whirl in the air, producing a remarkable appearance, well known to those accustomed to wander by the sea side. The ruffs belong to this sub-family, and form the genus *Philomachus* or *Machetes*. Only one species is as yet described, the common ruff, *P. pugnax*. This bird is of a remarkably pugnacious character, especially in spring, when the males wage furious combats with each other for the possession of the females. They arrive in this country early in the spring, soon after which the males assemble on some dry bank,

near a pool of water, in expectation of the females. Each male takes possession of a small spot of ground, round which he runs so often as to make a bare circular path; and as soon as a female alights, all the males within a certain distance commence a general fight, placing their bills to the ground, spreading the ruff of long feathers round their neck (from which they derive their name), and using the same action as the common cock. The ruffs are generally taken in large nets, and kept for the purpose of fattening; and when killed at the proper season, and cooked with the trail in, are reckoned a most delicious treat for an epicure. Their pugnacious disposition, however, is so great, that when kept for fattening, their place of confinement is obliged to be dark, as the moment any light is admitted they attack each other with such fury as to occasion great slaughter. It is remarkable that amongst these birds, unlike others of the family, the males are larger than the females. Vast numbers are brought from Holland to the London market. V. The snipes, *Scolopacinæ*, have the bill lengthened, rugose at the tip, which overlaps the lower mandible; the nasal groove extends nearly the whole length, their legs are slender and short, their toes rather long, and free at the base. These birds are inhabitants of the thickest under-wood; some seek the marshy districts. Their food consists of worms and insects. A peculiar character of the snipes consists in the compressed form of the head, and, in many, the backward situation of their large eyes, which imparts a singularly stupid air, in conformity with their habits. This is more especially the case with the woodcock, *Scolopax rusticola*. This



Scolopax rusticola—The Woodcock.

bird has a very wide geographical range. It breeds occasionally in this country, forming its nest on the ground, in a dry, warm spot among herbage, and is loosely fabricated of dead leaves, of the common fern principally. In summer it inhabits the high ground, descending into the woods in the month of October, when it is generally met with singly or in pairs, particularly in dull weather. The favourite food of the woodcock consists of earth worms, which it extracts with its long and sensitive bill with unerring certainty. The woodcock is a favourite with epicures, and, served with its trail in, is a delicious dish. The snipes are more common in this country than the woodcock. The common snipe, *Scolopax gallinago* (*Gallinago media*), is a well known bird, about eleven or twelve inches long, and weighs about four ounces. It frequents marshy places and wet meadows, and in frosty weather, the edges of rushy hills, where it is almost constantly digging and nibbling in the soft mud. It breeds in this country, though great numbers leave Great Britain in the spring, and return in the autumn. The snipe is a fat bird, but its fat does not cloy, and rarely disagrees with even the weakest stomach. It is much esteemed as a well flavoured and delicious dish. The Jack snipe, *S. gallinula* (*Gallinago gallinula*), is a considerably smaller bird than the last, seldom measuring more than 8½ inches in length, and weighing more than two ounces. Its habits and food are much the same as the other species, but it seldom rises from its lurking place until it is almost trampled on, and when flushed, does not fly to any distance. It seldom abandons for any length of time the place it has once fixed upon; and though roused from it, and fired at repeatedly, perhaps, through the day, neither the noise nor any sense of danger seems to alarm it; and if we should seek for it on the following morning, in all likelihood we should find it at its spring again. VI. The phalaropes, *Phalaropodinæ*, which form another sub-family of the *Scolopacidæ*, have the bill rather longer than the head, and depressed throughout its whole length; both mandibles are laterally grooved; their legs are moderate, slightly compressed, with the toes bordered with large scalloped membranes. They are found on the sea shores of the arctic regions, but frequently floating on the surface of the sea, even amidst its roughest waves. See PHALAROPUS.

Scolopendra. *The Centipede.*—See CHILOPODA.

Scolopendridæ. *The Centipede family.*—See CHILOPODA.

Scolytus.—A genus of tetramerous *Coleoptera* belonging to the *Xylophagi*, and forming the type of a small family, *Scolytidæ*. The beetles belonging to this genus, and their larvæ, are the cause of great destruction to timber trees. The adult insects attack the trees, burrow into the trunk, and there the female deposits her eggs. The larvæ, when hatched, form cylindrical galleries, diverging at right angles from the track of the parent, and parallel to each other; and so great is the fecundity of these insects, that their countless numbers are soon sufficient to destroy the largest tree. *S. destructor* is the most mischievous species in this country. It annually destroys great numbers of elm trees in the parks in the neighbourhood of London and in the provinces. *S. multistriatus* is the species which attacks the oak.

Scomber. *The Mackarel.* See SCOMBERIDÆ.

Scomberesox.—A genus of malacopterygious fishes belonging to the family *Esocidæ*. It contains the fish known by the name of the garpike. See ESOCIDÆ.

Scomberidæ.—A family of acanthopterygious fishes, composed of a multitude of species and many genera. They are fishes with small, smooth scales, a powerful and deeply cleft tail, long, narrow, pointed, pectoral fins; the foremost of the two dorsal fins composed of bony rays, and the hinder chiefly supported by soft rays, and often divided into numerous, small, false fins. They are provided with numerous cœca, and these are often united in clusters. The genus *Scomber* is the type of the family, and contains several species, with an elongated body, tapering at both ends. The common mackarel, *S. vulgaris*, or *Scomber*, is a well known fish, inhabiting the whole of the European seas, and affords an abundant and wholesome supply of excellent food to thousands in these islands. They are generally taken in drift nets, which are twenty feet deep, by 120 feet long, well corked at the top, but without lead at the bottom. The genus *Thynnus* contains two or three well known fishes. The tunny, *T. vulgaris* (*Scomber Thynnus*), is a fish abundant in the Mediterranean, and forms an important article of food to the inhabitants of the various countries bordering on that sea. It is one of the largest fishes of the ocean, and sometimes attains an immense size, measuring upwards of eight feet in length. When it weighs only 100 lbs., the Sardinians give it the name of "scampirro," a diminutive derived from scomber. When above that weight, and onwards to 300 lbs., it is called "mezzo-tonno," or half tunny. The larger individuals frequently weigh 1,000 lbs., and it is even said that old males weighing 1,800 lbs. have been taken occasionally. The fishery of the tunny is a very ancient one; and the city of Byzantium was more especially enriched by it. The shoals which entered the Bosphorus were said to meet near Chalcedon with a white rock, which so terrified them that they turned into the gulf of Byzantium, now the port of Constantinople. According to some authorities, it was in consequence of this abundance of tunnies that the gulf in question received the name of the *Golden Horn*. The immense quantities of these fishes are as remarkable at the present day as in ancient times. One author tells us that twenty vessels might be filled by a single cast of the net; and they may frequently be taken by the hand without the aid of nets. The Phœnicians appear to have established a fishery at a very early period on the coasts of Spain; and we find representations of this fish on Phœnician medals of Cadiz and Carteia. Its salted preparation was known to the Romans under the name of *Saltamentum Sardinicum*. The bonito, *T.* (*Scomber*) *Pelamys*, is a fish abundant within the tropics, and well known to all voyagers. It is a very pretty fish, of a fine blue colour, with four dark lines extending from the pectorals, along the side of the belly, to the tail. It is from a foot to a foot and a-half in length. *Lepidotus argyreus* is a large and handsome fish, belonging to this family. It is a native of the European seas, and has been taken on the coast of Great Britain. When seen in the water, it looks like a large and broad riband of silver, swimming with a wavy motion through the water, and casting from it in its progress the most beautiful reflections of light. It swims with the velocity of a bird, with its head above water, and is between five and six feet in length. *Nemichthys scolopacea* is a very singular-looking fish, lately discovered in the southern Atlantic, and which, though resembling in form that of the tæniidæ or riband fishes, has been referred to the scomberoids. It is remarkable for its greatly elongated form, tapering posteriorly into an exceedingly long filamentous-looking tail, while its head is longer than the abbreviated body, which indeed is many times shorter than the gape of the mouth. The genus *Xiphias* has the upper jaw elongated, forming a sword. *X. gladius*,

Xiphias gladius—The Sword-fish.

the sword-fish, is a native of the Mediterranean and Atlantic, and measures from ten to fifteen feet in length. The sword forms three-tenths of the whole length of the body, and it proves a powerful weapon of offence and defence. It is said to attack the whale, wounding it severely; and there are many well authenticated instances of ships having been perforated by it, and specimens of ships' timbers penetrated by its sword are preserved in many museums.

Scopelidæ.—A family of acanthopterygious fishes, nearly allied to the salmonidæ, and formerly belonging to, and forming part of, the salmon family. They are distinguished from the true salmons by the structure of the mouth, and by the ova being discharged by a proper canal, and not, as in them, falling into the general cavity of the abdomen. They are remarkable for the extreme metallic brilliancy of round spots, placed generally in rows along the body, or for other brilliant places about the head and elsewhere. Many are nocturnal, coming to the surface at night, and some have luminous eminences on the head, visible in the dark. They abound in the Mediterranean and China seas; but they appear comparatively rarely in northern latitudes. The genus *Scopelus* may be taken as the type of the family. One species, *S. Pennanti*, is found in Britain. The genus *Saurus* contains seven

species, remarkable for the forms of their teeth. In some they are long, slender, and barbed at the points, sometimes conical and curved, forming harrow-like bands on the jaws, the palatines, tongue, and pharyngeals. They are elongated fishes, with a wide mouth. *S. Nehereus* or *Ophiodon* is a native of India. It is a fish of voracious habits, and at certain seasons its body is brilliantly phosphorescent. Its flesh is rich food, though delicate, when newly taken. It is well known in India, and when dried and salted, it is exported in large quantities from Bombay and Malabar to other parts of India and to China, under the name of "Bombay ducks" or "Bummelows."

Scops.—A genus of the crane family. See ARDEIDÆ.

Scopulipedes.—A group of bees. See APIDÆ.

Scorpæna.—A genus of acanthopteryious fishes, forming the type of the family *Scorpænidæ*. The body is oblong and scaly; the head large, compressed laterally and spiny; cheeks and jaws without scales; upper jaws, vomer, and palatines armed with velvety teeth; a single dorsal fin; seven rays on the branchiostegous membrane. The typical species, *S. scrofa*, the hog-fish, is a native of the European seas, is of a large size, and of a red colour, with broad, smooth scales. It is very common in the Mediterranean, and though an ugly fish, is said to be very good eating. The sharp spines with which its head is armed inflict severe and dangerous wounds on those who incautiously handle it.

Scorpio. *The Scorpion.*—See SCORPIONIDÆ.

Scorpionidæ.—A family of annulose animals belonging to the class *Arachnida*, sub-class *Pulmonaria*, and order *Pedipalpi*. The body of these animals is long, the thorax and abdomen are intimately united, the cephalo-thoracic segment being tolerably large, followed by six articulations of nearly equal breadth, and six others suddenly narrowing, and forming what is often called the tail. This part of the body is terminated by a curved spur or sting, which is connected with a gland that secretes a poisonous fluid, and is discharged by two small orifices at its extremity. The palpi are very large, resembling extended arms, and are provided at their extremities with a didactile claw or pincer, like that of the lobster. They have six or eight eyes, one pair of which is often median, and larger than the others. Their spiracles or stigmata are eight in number, situated along the inferior and lateral part of the abdomen. At the base of the abdomen are placed two organs called combs, the use of which is not yet determined. Scorpions are carnivorous animals. They feed chiefly upon insects, seizing hold of them by means of their palpi, and stinging them to death. When they walk, they move along with their tail elevated on high, ready to use either as an organ of defence or offence, as necessary. They are generally found living in dry places, and in dark situations. The females are larger than the males, but do not appear to be so numerous. They are oviparous animals,

Scorpion.

and the young are carried about by the mother for some time after birth. Scorpions are found natives of both Old and New Worlds, are pretty widely dispersed, but are chiefly found in warm climates. The genus *Scorpio* is the type of the family, and it contains many species. *S. europæus*, a species found in the southern parts of Europe, does not possess a very venomous sting; but others, larger, and natives of hot climates, are formidable creatures, their sting producing serious and alarming symptoms. Such is *S. afer*, which is five or six inches long, and is a native of Ceylon and other parts of India.

Scorzonera (Spanish word for common species of the genus).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Chicoraceæ*, and consisting of herbs, natives of southern Europe. *S. Hispanica* is the type of the genus, and is well known as the scorzonera of the Spaniards. It is a native of Spain, and is much cultivated in that country as a pot-herb. The root is the part which is eaten, and forms a wholesome and agreeable article of food.

Scrophularia.—See SCROPHULARIACEÆ.

Scrophulariaceæ. *The Fig-wort family.*—A nat. ord. of dicotyledonous plants, the species belonging to which are herbs, abounding most in temperate climates, but also found both in tropical and arctic regions. The leaves are generally exstipulate, or the stipules are very small. The juice of these plants possesses very varied properties. In some it is watery. In others, as *Verbascum*, it is mucilaginous. In the *Veronicæ* it is bitter, as it is also in *Scrophularia* and some others. In the *Pedicularieæ* and *Gratiolæ* it is astringent; and in *Digitalis* it is highly narcotic. The genus *Scrophularia* is the type, and contains numerous species, about eighty-five having been described. They are principally natives of temperate climates, more especially in the Mediterranean region. *S. nodosa* may be taken as the type; a common plant on ditch sides, woods, and moist places. Its root is swollen and knotty, and it was supposed to resemble scrofulous

tumors of the neck. As in former times it was pretty generally believed that nature thus pointed out the proper remedies for different diseases, this plant was immediately supposed to possess great virtues in cases of scrofula, and was largely used for that purpose externally. Hence the name for the plant, which was afterwards adopted for that of the genus. At the present day it is said to be used on the continent, in form of an infusion, as a wash in cases of itch. *S. canina*, a native of Italy, is used in like manner as a cure for the mange in dogs. The flowers of *S. nodosa* contain generally a quantity of honey, and are remarkably attractive, in consequence, to wasps and bees. "Flores vesparum deliciæ," says Linnæus.

Scutelleridæ. *Shielded Bugs.*—A family of hymenopterous insects belonging to the sub-order *Geocorisa* or land bugs. The species are very numerous, and are distinguished by having long antennæ, and a scutellum generally very large, and covering the elytra, wings, and abdomen. The body is generally rather short and oval, and they are often remarkable for brilliancy of colours, red, green, and metallic hues adorning the greater part of their body. They are chiefly natives of hot climates, as India and Africa. They feed upon plants.

Scutellidæ (*scutellum*, a small shield).—A family of radiated animals belonging to the class *Echinodermata*, and order *Echinidæ*. The shell is of a circular or elliptic form, and generally very depressed. The mouth is circular, and situated near the centre of the under side. The ambulacra are arranged so as to form a resemblance to the petals of a flower. The family contains a number of genera and species, both recent and fossil. Some are rather convex, as *Echinanthus*, but most are very depressed, as *Scutella*.

Scutibranchiata (*scutum*, a shield; *branchiæ*, gills).—An order of molluscous animals belonging to the class *Gasteropoda*, in which the gills or lungs are protected by a shield-shaped shell, such as *Haliotis*, *Fissurella*, &c. In Dr. Gray's arrangement it forms an order characterized by the animal possessing gills which consist of two series of lamellæ, forming one or two series over the back of the neck, or under the edge of the mantle round the foot, and contains numerous families of shells, of a spiral or symmetrical conical form, as *Neritidæ*, *Turbinidæ*, *Trochidæ*, *Haliotidæ*, *Fissurellidæ*, &c.

Scyllæa.—A genus of nudibranchiate gasteropodous *Mollusca*, belonging to the family *Tritoniidæ*. This genus was founded for the reception of a small pelagic mollusc, found on the floating sea-weed, *Sargassum natans*. This species has been observed since in several parts of the world. It has no shell, and the gills are tree-like, and placed on fin-like processes on the edge of the back. The body is compressed, and the foot narrow, which enables it to clasp the stems of the sea-weed on which it is found.

Scyllaridæ.—A family of crustaceous animals belonging to the order *Decapoda*, and tribe *Macroura*. The species are distinguished by having a wide carapace, and the external antennæ foliaceous and extremely wide. The family contains three genera and several species.

Scytale.—A genus of reptiles belonging to the order *Ophidia*, tribe *Venenosa*, and family *Boidæ*. The species are stout, cylindrical, and rather long. The back and tail possess keeled scales. The poison fangs are similar to those of the rattlesnake, and the species are all highly poisonous. One of them, *S. pyramidum*, is a native of Egypt, and is very common in the neighbourhood of Cairo and the pyramids. The inhabitants know it well, and dread its bite exceedingly.

Scythrops (*σκυθρωπος*, sad).—A genus of birds belonging to the order *Scansores*, and family *Cuculidæ*. The species upon which the genus is founded, *S. Novæ Hollandiæ*, is, as its name imports, a native of Australia. It is a wild, untameable bird, and feeds chiefly upon the seeds of trees, but also upon insects, as beetles and phasmidæ. It has a very strong, sharp, and disagreeable cry; the natives call it *Goe-ze-egung*. They consider that when it makes its appearance, which it does in small flocks of seven or eight individuals, and utters these cries, it is a sure sign of a storm.

Scytosiphon.—A genus of *Algæ*. See THALLOGENÆ.

Sebastes.—A genus of acanthopterygious fishes belonging to the family *Scorpænidæ*. *S. Norvegica*, an inhabitant of the northern seas, is known by the name of the Norway haddock. When quite fresh it is of a bright carmine colour, and resembles the perch in form. Its flesh is dry, but much esteemed by the Greenlanders.

Secale. *The Rye.*—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*. There are about five species known, and one of these, *S. cereale*, the common rye, is of great importance. It is very much cultivated throughout all parts of Europe, and is said to be found growing wild in the Crimea, in the neighbourhood of Caucasus, and on the shores of the Caspian Sea. Rye is easy of cultivation, succeeding even in barren soils, and is a hardy plant, bearing the severity of a northern climate very well. It is very little used in this country, compared with continental Europe, where bread made of rye is in constant use. A kind of beer is brewed from it in place of barley; and in the north of Europe, a spirit is distilled from it resembling brandy. The grain of rye is subject to a disease produced by a minute fungus. When attacked by it, it assumes an oblong shape, curved like a spur, and hence called "ergot" of rye—see THALLOGENÆ, under head of *Fungi*. This diseased grain has an extraordinary effect upon the uterus, and is in consequence very much used by physicians.

Sechium.—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*. *S. edule* is a plant very much cultivated in the West Indies, where its fruit is called *Choco*. It is used in various ways, and is much esteemed by the Creoles. In some parts of Jamaica it is so abundant that the fruits are used to fatten pigs.

Secondaries.—A word used in ornithology to designate those quills which rise from the second bone of the wings.

Sedum. *The Stonecrop.*—A genus of plants. See CRASSULACEÆ.

Seguieria.—A genus of apetalous dicotyledonous plants belonging to the nat. ord. *Phytolaccaceæ*, growing in tropical America. The species are shrubs and small trees, with alternate leaves, generally possessing strong spines as stipulæ, and flowers disposed in bunches or panicles. *S. alliacea* is a native of Brazil, and is without spines. Its roots, wood, and all other parts, exhale a disagreeable odour of garlic and assafœtida. The natives use the leaves and wood for medicating baths, which they consider very efficacious in cases of skin diseases, rheumatism, &c. The wood contains, it is said, a great quantity of potass, and a good lye is prepared from it, which is used for clarifying sugar, and for making soap.

Selaginites.—A genus of fossil plants found in the coal measures. It is considered to be nearly allied to the genus *Lycopodium*.

Selenite (σελήνη, moon). *Moonstone.*—A mineral composed of crystallized hydrated sulphate of lime. It occurs in oblique prismatic crystals, and when it is split into very thin laminæ, the colours are very beautiful under polarized light. On this account it is much used by microscopic observers.

Semecarpus (σημεῖον, a mark; κάρπος, fruit).—A genus of plants to which the marking nut belongs. See ANACARDIACEÆ.

Semnopithecus.—A genus of monkeys, class *Mammalia*, order *Primates*, family *Simiidæ*. The canine teeth are much longer than the incisors; the head is round; facial angle more open than that of the orang's; face flat; limbs very long in proportion to the body; anterior thumbs very short; cheek pouches small or none. The stomach is very large and complicated. The hinder limbs are longer than the fore ones, and the tail is very long and slender. When at rest and unemployed, it is allowed to hang down perpendicularly, and from its great length, has a very droll effect, which is heightened by the natural apathy and imperturbable gravity of the creature itself. They are called slow monkeys, and indeed, when not excited, they are very solemn, appear sad and melancholy, and do not seem to take the slightest interest in anything that passes around them. When roused, however, they exhibit such variety, rapidity, and precision of movements, and use such surprising exertions, as to make this name a misnomer. Several species are described. *S. maurus*, the budeng, is a native of Java, in the extensive forests of which island it is found in abundance. It lives in trees and in society; and is hunted by the natives for the sake of its skin, which they prepare with much skill for riding equipages and military decorations. *S. Entellus*, the entellus monkey or hoonuman of the Hindoos, is a native of Bengal, the Himalayas, Nepâl, and Bootan. It is about 4½ feet from the muzzle to the root of the tail—this latter organ being longer than the body itself. The hoonuman is considered sacred amongst the Hindoos, and carefully preserved from danger. They believe that any person who kills one of these monkeys is sure to die himself within the year.

Sempervivum (*semper*, always; *vivum*, alive).—A genus of plants containing the houseleek. See CRASSULACEÆ.

Senecio.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*. This genus is one of the most extensive amongst flowering plants. The number of species described are nearly 600, and they are dispersed over the whole globe. They are herbaceous or shrubby, with alternate, entire, or pinnatifid leaves, and their flowers are in small heads, solitary or grouped in a corymb or panicle. *S. vulgaris*, the common groundsel, is an exceedingly common plant, growing almost everywhere in all the temperate and even cold parts of the Old World, and appears to be one of those plants which have followed the steps of civilized man wherever he has gone. It is a great favourite with small singing birds, and in London forms an article of considerable importance to poor people who collect and sell it for that purpose. One or two species are handsome, and are cultivated as ornamental plants.

Sepal.—The leaves of the calyx are called sepals, as those of the corolla are called petals.

Sepia.—A genus of molluscous animals belonging to the class *Cephalopoda*, order *Dibranchiata*, section *Decapoda*, and family *Sepiidæ*. The body of the animal is fleshy, depressed, and contained in an oblong sac which is fringed on each side throughout its whole length with a narrow fin or wing. The shell, which is internal, is of a calcareous nature, and consists of a broad laminated plate which is spongy, friable, and light, and terminates behind in a hollow, imperfectly chambered apex, called *mucro*. The laminæ are numerous, placed parallel and obliquely, so that each succeeding plate covers the other, the *last* one covering almost entirely all the preceding. They are separated from each other by vertical fibres, so that though the shell is very thick in front, it is light and porous. This substance is commonly called the *bone* of the cuttle-fish. Their mouth is surrounded by ten arms, two of which, called the tentacula, are much longer than the others, and expanded at the ends. The arms are provided with four rows of suckers. The eyes are two in number and large, somewhat resembling, in structure, those of fishes. The mouth

is armed with two horny jaws which resemble, in form, a parrot's beak. Near the heart is placed a vesicle which contains a liquid of a very black colour, and is called the ink bag. The animal has the power of discharging this black inky secretion at pleasure, and it uses it as a means of defence against its enemies, diffusing it through the water, so as to be able to retreat under cover of the cloud it has occasioned. This inky secretion, when dried, furnishes the substance used by painters, called sepia; and was formerly used for writing with. The substance called Indian ink, so extensively prepared in China, was believed formerly to have been made from it, though now it is pretty well ascertained to be manufactured from lamp black or prepared charcoal. The species of *Sepia* are not very numerous, though their geographical distribution is world-wide. About thirty recent and five fossil species have been described. They live near the shore, and the mucro of their shell seems intended to protect them in the frequent collisions they are exposed to in swimming backwards. The best known species is the common cuttle-fish, *S. officinalis*, whose shell is so often thrown up by the waves on the beach. At one time, and even at the present day, in some parts of Europe, the cuttle-fish was used as an article of food. Some foreign species attain a large size, and the bone of one, a native of China, has been found to attain a length of 1½ foot.

Sepiola.—A genus of dibranchiate, decapodous cephalopods, belonging to the family *Teuthidæ*. The body is short and purse-like, and the fins, rounded and contracted at the base, are situated near the middle of the body.

Sepioteuthis.—A genus of dibranchiate decapodous cephalopods, belonging to the family *Teuthidæ*. The animal is like *Loligo*, but differs from it in having the fins lateral and as long as the body.

Seps.—A genus of reptiles belonging to the order *Saura* and family *Scincidæ*. The feet in this genus are four in number, but are very short and slender, scaly, and terminated in some of the species by one or more very small fingers, though in others there are none at all. The body is more elongate than the generality of the scincidæ, and the members being nearly rudimentary, the species seem to form the link between the saurians and ophidians. The typical species, *S. chalcides*, is about a foot long, and its elongate body and pointed tail give it very much the appearance of a serpent. The ancients knew it, and regarded it as poisonous, though now it is universally considered to be perfectly harmless. It feeds upon spiders, small land shells, and insects. It is common in the south of France, Italy, and the region of the Mediterranean. *Sphenops sepsoides* is a native of Egypt, and its habits are very much like those of the common skink, though it is about a third less. This species is one of those animals the ancient Egyptians used to preserve as mummies. Several specimens have been found enveloped in linen bandages in the same manner as the human mummies are, and were preserved in little wooden coffins.

Septaria = Cuphus = Cloisonnaria.—A genus of molluscous animals belonging to the class *Conchifera*, and family *Pholadidæ*. The genus was founded to receive a species of shell which was not known in a perfect state, portions only having been brought to Europe. *S. arenaria* is a native of the seas about Amboyna, &c., and is now ascertained to be formed in a similar manner to *Teredo*, to which genus it is considered by some conchologists to belong. The shell consists of a long tube, sometimes three feet in length, which like the shell of *teredo* has the cavity divided at the extremity by a septum into two equal tubes. It lives in the sand of the sea shore, instead of boring into wood.

Septaria (*septum*, a fence).—In Mineralogy this word is used to designate a mineral substance composed of nodules of limestone mixed with clay and divided by fissures, which are usually filled with plates of spar and other minerals.

Sericteria (*serica*, silk).—The glands which secrete the substance called silk, in the silk-worm.

Serolis.—A genus of crustacea. See Isopoda.

Serpentarius. *The Secretary Bird.*—A genus of birds belonging to the order *Accipitres*, and forming the type and only genus of a separate family by itself, *Serpentariidæ*. The secretary bird, *S. reptilivorus*, is a native principally of South Africa, near the Cape of Good Hope, and is about three feet in length. The bill is strongly hooked, the legs are very long and slender, and the wings are armed with obtuse spurs. It obtains its English name from the tuft of plumes which it carries at the back of its head, giving somewhat the appearance of a quill stuck behind the ear, as clerks are in the habit of doing. It is also called the serpent-eater, from the fact of its food consisting chiefly of these reptiles. This bird seems to have a natural antipathy and aversion to serpents, so that it is of great service in keeping down the numerous creatures of that kind that so abound in South Africa. It attacks the larger snakes with great boldness, and covering its body with one of its wings as with a shield, it strikes its enemy with the other, the obtuse spines with which it is armed rendering it a fit instrument, like a club, with which to overpower it. The secretary bird is very voracious, Le Vaillant finding in the crop of one which he killed, eleven rather large lizards, three serpents as long as one's arm, eleven small tortoises, some about two inches in diameter, and a quantity of locusts and other insects besides. These birds are found also in the Gambia and Philippine Islands, and as they differ a little from each other, have been by some naturalists considered as distinct species. They live in pairs, not in flocks; build their nests on high trees, and run with such

swiftness, that they can with difficulty be approached by sportsmen.

Serpentine.—A rock composed of silicate and hydrate of magnesia. It is of an obscure green colour, and the colours being mixed in bands or spots, some of a clear green, others dark, give it somewhat the resemblance to the skin of a serpent—hence its name. It is of a compact texture, of a waxy or scaly fracture, very tenacious, and smooth to the touch. Though its composition is generally silica, magnesia, and water, a portion of the magnesia is often replaced by the oxide of iron. There are several varieties of serpentine—as *Precious Serpentine*, of a rich oil-green colour and translucid—*Foliated Serpentine* or *Marmolite*, of a greenish-white and light green colour, of a pearly lustre and consisting of thin folia, easily separable and brittle—*Common Serpentine*, opaque and of a mixture of colours, generally dark. This kind of serpentine is found in large masses, and is used in some countries for making pots adapted for cooking. A rock of this kind is found at Chiavenna near the lake of Como in the Canton of Grisons. It is of an azure-gray, and is very well adapted for being worked into vessels which can sustain the action of fire. Serpentine often forms veins in limestone, and the result is the verd-antique marble or serpentine marble. It takes a fine polish, is a very handsome stone, but does not wear well. Being decomposable by acids it may be used as a source of magnesia in manufactures. Serpentine is common in the south of Europe, in England and Scotland, in the United States of America, &c.

Serpulidæ.—A family of worms. See ANNELIDA.

Serranus (*serra*, a saw).—A genus of acanthopterygious fishes belonging to the family *Percidæ*. The species are small, of an elegant form and brilliant colours, and are known by the name of sea perches. *S. scriba* is a native of the Mediterranean, and is peculiarly marked with irregular lines traced on the cranium, muzzle, and cheek, which resemble characters in writing. It is a very pretty little fish about eight or ten inches long, and is brilliantly coloured. It feeds upon small crustacea and little fishes, and more especially upon cuttle-fishes. Two species are found on the British coasts.

Serrasalmo or **Serrasalmus** (*serra*, a saw; *salmo*, a salmon).—A genus of abdominal malacopterygious fishes, formerly belonging to the family *Salmonidæ*, but by late writers placed in the allied group *Characinidæ*. This genus, containing several species of very voracious fishes, chiefly inhabiting the fresh waters of Brazil and other parts of South America, is characterized by having a large, flat, and obtuse naked head; large eyes situated anteriorly on the sides of the head, and surrounded by large suborbital bones; nostrils placed just before the eye; a large, transverse, arched mouth, with a prominent mandible, very large intermaxillary bones, and large, triangular teeth, broad at the base, serrated on the edges, very sharp at the apex, and disposed in a simple series. The body is broad, compressed, and covered with minute scales. The abdomen is keeled and serrated, and the fins are of moderate size, the anal being the broadest. The piranha, *S. Piranha*, is a native of the river San Francisco, in Brazil, and the lakes, ponds, and streams in the neighbourhood. The fish is about fifteen inches long, the body of a compressed form, but thick, and covered with very small, close set scales. The head is very obtuse, and truncated, and continued in a straight line with the neck. The body is of a green colour above, and the sides, with the head and fins, of a yellowish hue. The mouth is armed with a double row of sharp teeth, so closely set together, that their jaws when strongly closed, cut whatever they lay hold of, as easily as a razor cuts hair. So formidable a weapon, indeed, is this mouth, that the Quirrubas Indians are said to use the jaws made into a kind of scissors or shears, with which to decapitate their slain enemies—hence the name *Piranha*, which the natives give this fish, and which means "cutting fish." The Portuguese call it "Peixe Tezoura." It is exceedingly voracious and bloodthirsty, so that it is looked upon with great fear, and considered the most formidable tyrant of the fresh waters. Bathers particularly dread them, as they are often assailed the moment they enter the water, and have dangerous wounds inflicted before they are able to escape. It often happens that an ox, a tapir, or other large animal, is attacked immediately it enters the river, by a swarm of these voracious fishes, who devour it in an incredibly short time, leaving nothing but the skeleton. This habit is turned to account by the Guaraunos who inhabit the banks of the Orinoco. These Indians are accustomed to preserve the skeletons of their dead in baskets, and by placing the dead body for one night in the river, it is rendered in that short time a perfect, and excellently prepared skeleton. The animals which live upon the banks of the rivers infested with these fish, adopt, according to the testimony of the natives, a plan to avoid their attack, when they require to drink at the stream. Horses and dogs, it is said, are observed to select a particular spot and create a great commotion in the water, knowing that such immediately attracts the piranhas. They then take to flight to a different spot where they may quench their thirst in safety. Even with this precaution, they are said to have their lips often bitten off by their watchful enemies. The crocodile itself is not safe from their bite; and the most ferocious of all the wild animals of Brazil, the ounce, *Felis onca*, succumbs to their power when it takes the water. The Brazilian otters, indeed, whose body is defended by a dense covering of finer hairs under their long external coat, are the only animals said to put these voracious fishes to flight. Their love for blood is such, that a single drop

thrown into the water, will bring them in thousands to the surface, though their usual haunt is at the bottom. *S. albus*, *S. nigricans*, and one or two other species which inhabit the rivers of Brazil, and other parts of South America, are almost equally voracious in their habits, and nearly as much dreaded by the natives, and animals which frequent the rivers where they dwell. From their ferocity and love of blood, they are called by the Spaniards, "Pexe Caribe," resembling, they imagine, in cruelty of disposition, the Caribs or original natives of the country.

Serratula (*serratus*, toothed like a saw).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Cynarocephalæ*. Several species are contained in this genus, amongst which the most particular one is *S. tinctoria*, which is so named from the colouring matter contained in the root, and which is used for dyeing yellow.

Serricornes.—A large group or section of pentamerous *Coleoptera*, containing the families *Buprestidæ*, *Elateridæ*, *Lampyridæ*, &c., &c.

Sertularidæ.—A family of zoophytes. See ANTHOZOA.

Sesamum.—A genus of plants. See BIGNONIACEÆ.

Sesbania.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and sub-order *Papilionaceæ*. The species are trees or shrubs with multipinnate leaves, and bunches of generally yellow flowers dotted with black spots. They grow in all tropical countries and in the warm parts of North America. *S. Ægyptiaca* is a glabrous shrub, a native of India, Senegal, and Egypt. In this latter country it is generally cultivated in hedges, where it is very useful, as it grows with extreme rapidity. The leaves are said to be much used in Egypt as a substitute for senna. The wood is employed in making the best charcoal for gunpowder. *S. cannabina* is the dhanchi of Bengal, which is cultivated in India for the sake of the fibres of its bark, which are used for making drag ropes and other cordage about fishing nets.

Seseli.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*. The species are biennial herbs, with pinnated leaves, and umbels of generally white flowers without involucre, and are natives of Europe, North America, and Central Asia. The best known species is *S. tortuosum*, a native of Southern Europe, where it is found growing on rocks in dry arid places. The leaves are of a very glaucous appearance when growing wild, but losing this when cultivated. The seeds have an aromatic smell, somewhat like anise seed; and from them is prepared a liquor which is used as an ordinary drink. The plant is considered to possess anthelmintic properties, and to be a cordial diuretic. It used to enter into the composition of some of the old-fashioned compound preparations, as theriacum, &c.

Sesia.—A genus of lepidopterous insects, characterized by having the antennæ always simple, elongate-fusiform, and often terminated by a small bundle of scales. These insects live in the larva state for two or three years, and are generally found living in the substance of shrubs and trees. With the debris of the substance upon which they feed they construct a case, lined internally with close silk, in which they undergo their metamorphosis. Many species are known, and it is remarkable how the perfect insects assume the forms of various *Hymenoptera*—thus one, *S. apiformis*, resembles in appearance the bee; *S. spheciformis*, that of a sphex; *S. ichneumoniformis*, that of an ichneumon, &c. They are swift in their flight, but frequently alight upon flowers to suck the juices. They fly during the hottest sunshine.

Setæ.—Organs in insects and other animals, which either are or resemble bristles.

Setaria (*seta*, a bristle.)—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*. It derives its name from the bristly nature of its involucrum. Two or three species, as *S. Germanica* and *S. Italica*, are cultivated as articles of diet in some parts of Europe.

Shorea (after *Sir J. Shore*, Lord Teignmouth, Governor-General of Bengal).—A genus of dicotyledonous plants belonging to the nat. ord. *Dipterocarpaceæ*. The most important species belonging to the genus is *S. robusta*, a lofty and ornamental tree with showy flowers, growing in India. In the north-western parts of India it is used for many purposes, for house timber, gun carriages, &c. It is known to the natives by the name of "Sál," and the resin which it exudes is called "ral;" this is used by the Europeans as a substitute for pitch in the dockyards, and by the Hindoos as an incense.

Sicydium (σίκυα, sucker).—A genus of acanthopterygious fishes belonging to the family *Gobiidæ*, distinguished by having its ventral fins united and adhering nearly equally in all parts, so as to form a bell-shaped or round hollow basin. The species are natives of the fresh waters of the West Indies, the Isle of France, Bourbon, &c. *S. Plumieri* is common in Martinique, where it is called the sucker, from the use which it makes of its bell-shaped ventral fin, fixing itself by means of it to different objects, as by a sucking-glass. *S. lagocephalum* is equally common in the rivers and fresh water lakes of the Isle of France. The adult fish, it is said, never go down to the sea, but allow their eggs to be carried thither by the current of the river, as it is necessary, for their being hatched, that they should do. The flesh of both these fishes is very pleasant, and much esteemed by the colonists of both countries.

Sida.—In Botany this name is applied to a genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*, containing about 200 species of herbaceous and shrubby vegetables, scattered

over the tropical parts of the world. Some of them are cultivated as objects of ornament for our gardens, for instance, *S. napæa*, a fine species, a native of Virginia. Most of them abound in a mucilaginous juice, and many of them have tough, ligneous fibres, which are employed for the purpose of cordage in different countries. *S. tiliæfolia* is cultivated in China for the sake of its fibres, which are used as a substitute for hemp and flax.

Sida.—In Zoology this name is applied to a genus of entomostracous *Crustacea*, belonging to the family *Daphniidæ*. Only one or two species are known. *S. crystallina* is a native of the ponds and ditches of England and other parts of Europe.

Sideroxylon (σιδηρος, iron; ξυλον, wood). *Iron Wood.*—A genus of dicotyledonous plants belonging to the nat. ord. *Sapotaceæ*. The species are evergreen trees, with axillary and lateral fascicles of flowers, and are found growing in Africa, America, the East Indies, and Australia. The wood of these trees is remarkably hard and weighty, sinking in water; hence their name, iron wood.

Sieboldia.—A genus of reptiles. See PSEUDOSAURA.

Sienite.—A rock composed of a mixture of crystals of quartz, felspar, and hornblende. It differs from granite in having hornblende in place of mica.

Sigaretus.—A genus of gasteropodous *Mollusca* belonging to the family *Naticidæ*, and synonymous with *Cryptostoma*. The shells are ear-shaped, have the aperture very wide and oblique, and the spire very small. Upwards of twenty species have been described, some very flat, and others convex. The flat shells are entirely concealed by the mantle when living, the convex species only partially, and they have a yellowish epidermis. *S. haliotoides* is found in the Atlantic and Mediterranean Seas, whilst others are found in the seas of tropical climates.

Sigmodon (σ, sigma, Greek letter; οδους, tooth.)—A genus of rodent animals belonging to the family *Muridæ*, and sub-family *Arvicolinæ*. It contains only one species, *S. hispidum*, a small animal about six inches long, with large head and pointed muzzle, short fore legs, and long hind ones. It is of a pale ochreous-yellow colour above, and an ashy-gray underneath. It is a native of Florida, living in cultivated districts, and doing much damage to the crops in the fields where it is found.

Sigillaria.—A genus of fossil plants belonging to the coal measures, and appearing to have materially aided in the formation of coal. They occur in the form of compressed, longitudinally fluted stems, some of them forty or fifty feet high and five feet broad. Their exact position is not quite clear. According to some they are dicotyledonous plants, and allied to the coniferæ. In the opinion of others, they ought to be referred to the palms, whilst many botanists contend that they are arborescent ferns. The advocates of this opinion say, that if in imagination we delineate a channelled stem of any height between twelve

Sigillaria pachyderma.

and one hundred feet, crowned with a pendant fern-like foliage, furnished with wide-spreading, fibrilled roots, and growing in some densely wooded swamp, we will form a tolerably close restoration of a sigillaria vegetating in its true habitat.

Silene. *The Catch-fly.*—A genus of dicotyledonous plants belonging to the nat. ord. *Caryophyllaceæ*. The species are numerous, and in general herbaceous and annuals, rarely shrubby. They are natives for the most part of the south of Europe and North Africa. The leaves are opposite, simple, and entire; the flowers usually delicate and elegant, and some giving off a delicious perfume at night. The stems are jointed, and frequently glutinous below each joint. The calyx and leaf-stalks are often viscous. This is especially the case with *S. muscipula*, the summits of the plant attracting insects and retaining them attached to it. *S. armeria* is a showy species, with large glaucous leaves, and small rose coloured flowers, grouped in a dichotomous corymbiform cyme. It is a native of France, and is cultivated as an ornamental plant. *S. acaulis* and *S. noctiflora* are two British species; the former growing on the Scotch mountains, on Snowdon, the highest hills in Devonshire, and found abundantly on the Alps; the latter, rather a rare plant in this country, but more common in Germany and Sweden, and remarkable for only opening its flowers at night and in warm weather, when they exhale a powerful and delicious scent.

Silica.—A compound of oxygen and *Silicon* or *Silicium*, forming one of the most abundant substances in nature. It occurs either in a crystallized form, or in amorphous masses.

When it is crystallized, it forms the well known substance called rock crystal. This substance occurs generally in granite mountains, as in Dauphiny, Tyrol, Savoy, and Brazil, from whence the crystals used for spectacles are imported. Rock crystal occurs of different colours, and accordingly receives different designations. When violet, it is called AMETHYST. When red, *rose quartz*. The green rock crystal is the *prase*, and the yellow is the CAIRNGORUM, &c. When silica occurs amorphous or semi-crystalline, it assumes various forms and receives various names—as QUARTZ, which is a white, nearly pure form of silica; CALCEDONY, a stalactitic form apparently deposited from solution in water; CARNELIAN, of red and white colours, principally in the trap rocks of India. Other varieties are ONYX, *Heliotrope* or bloodstone, *Chrysoprase*, MOCHASTONE or moss jasper, AGATE, FLINT, OPAL, and wood opal, JASPER, *Basanite* or Lydian stone, and *Hyalite*.

Siliquaria (*siliqua*, a pod).—A genus of molluscous animals belonging to the class *Gasteropoda*, and family *Vermetidæ*. The shell of siliquaria differs from vermetus, in having the tube, which is irregularly twisted, though regularly spiral at first, cleft longitudinally with a continuous, sub-articulated slit. It is covered in general with a brown epidermis. Sometimes these tubular shells are solitary, at other times conglomerated into a considerable sized mass. As in vermetus, the animal has a horny and spiral operculum. The species, which are not numerous, are found in the Mediterranean and Australian Seas, inhabiting sponges. About ten species are found fossil in the miocene.

Siluridæ.—An extensive family of malacopterygious fishes, composed of numerous species, for the most part confined to the fresh waters of warm climates. There is great diversity of form amongst them, and they are accordingly divided into a considerable number of genera. Their most obvious external characters are the absence of true scales. Their skin is naked, but has frequently large bony plates imbedded in it. The first rays of the pectoral and dorsal fins are very strong and bony, and the animal has the power of fixing them immovably, so that they form dangerous weapons, inflicting severe wounds upon those who handle it. They have often an adipose dorsal fin, and their intermaxillaries form the margin of the upper jaw, their maxillaries being reduced to mere vestiges, or elongated into beards, some of them longer than the body. They are found in the rivers of India, and in those of Africa, from the Nile to the Cape of Good Hope. They abound also in the rivers of the warm parts of America. Species have been found in lakes at a great height above the level of the sea. In the great Asiatic chain of mountains, a species has been observed at an elevation of 2,000 French metres; and another, *Arges Sabalo*, has been found in the mountain streams of Peru at a height of from 4,500 to 4,800 French metres. An interesting species, which has been described under the name of *Pimelodus Cyclopum*, but which very probably belongs to the genus *Arges* also, has been observed living in lakes on the mountains of Quito, and to have been thrown up in great numbers from the craters of volcanoes at an elevation of 5,000 metres above the sea. Some of the species, as *Doras costatus*, the flat-head hassar, have the power of living a long time out of water, and have been found traversing pretty extensive plains, while moving from one locality to another. The genus *Silurus* is the type, and *Silurus glanis* is the largest of all the European species of the family. It is a large fish, sometimes upwards of six feet in length, and weighing 300 pounds. It is of a greenish colour, marbled with yellow, and is found in the lakes of Switzerland, in the Danube, the Elbe, and all the rivers of Hungary, in Prussia and Sweden, in the lake of Haarlem, in the Black Sea, and Asia Minor, &c. This silurus is said to be a sluggish fish, generally remaining at the bottom of the water till it is disturbed by tempests, &c. It is very voracious, and its flesh is said to be very good to eat, though it is fat, luscious, and soft. A very good kind of isinglass is obtained from its air bladder.

Silurus.—See SILURIDÆ.

Silver = Argentum.—One of the most precious metals, well known and highly valued from the remotest period. It occurs native and in different ores. Native silver is met with in most parts of the world, but in largest quantity in Mexico and South America. It is white, without either taste or smell, and of a brilliant shining colour. Specific gravity 10·338; hardness 4·25. The silver of commerce is chiefly obtained, however, from its various ores. The silver of South America is derived principally from the horn silver or chloride of silver, the brittle silver or sulphuret, and the vitreous silver or sulphide, which occur in various parts both of Europe and America. The largest masses are brought from Mexico and Peru, and are found in veins in primitive rocks. Besides these, silver is obtained in large quantities from galena or lead ore, and from different ores of copper. Some galenas are so rich in silver that the lead is neglected for the more precious metal. In England, in 1837, 40,000 tons of this ore were reduced, containing, upon an average, about six ounces of silver in a ton of lead. The annual product of the several countries of Europe and Russia amounts to 5,230,000 dollars. At the beginning of the present century, the quantity of American silver was six times this amount, yielding about 31½ millions of dollars. The whole sum from Europe, Russia, and America, amounts to nearly 2,000,000 pounds avoirdupois. Silver is equal in brilliancy to all the metallic bodies, with the exception of polished steel. It is softer than copper, but harder than gold. When melted its

sp. grav. is 10·474, when hammered 10·5. In malleability it is inferior to none of the metals, except gold. It may be beaten out into leaves only $\frac{1}{100000}$th of an inch thick; and is so remarkably ductile, that a single grain may be drawn out as a wire 400 feet in length. Its tenacity is great, so that a wire 0·078 inch in diameter, will support a weight of 187 pounds without breaking. Silver is easily alloyed with copper, by fusion. The standard or sterling silver of Great Britain, of which coin is made, is a compound of 13⅓ parts of silver to 1 of copper. Its sp. gr. is 10·2. French silver coin consists of 1 copper and 9 silver. Sp. gr. 10·175. Dutch silver is 1 copper to 11½ silver. Russian 1 to 3½. Hamburg, equal parts.

Simarubaceæ.—A nat. ord. of dicotyledonous plants, containing amongst other species the trees from which we derive the quassia and simarouba woods of commerce. See QUASSIA.

Simiidæ. *The Monkey tribe.*—A family of quadrumanous animals belonging to the class *Mammalia*, order *Primates*, and containing those creatures so well known under the name of apes and monkeys. The species of quadrumanous animals are numerous, and may be divided into two large groups; those of the New World forming the family CEBIDÆ, which see; and those of the Old, the family *Simiidæ*. The chief zoological characters of this family are, their having the same number of teeth, and similarly disposed, as man; a thin septum between the nostrils; the rump generally protected by a hard naked skin; and pouches on the sides of the mouth, between the cheeks and the jaws, in which they place their food for safety. They have, generally speaking, tails, but the true apes, *Simiinæ*, have none. They are entirely confined to the warmer parts of the Old World, especially Asia and Africa, a single species alone having been naturalized in Europe, on the rock of Gibraltar. They may be divided into several sub-families. The true apes, *Simiinæ*, have no tail, and bear the nearest resemblance to the human form of all quadrumanous animals. They mimic as it were the "lords of the creation;" and their name is derived from the Latin "simia," an imitator. First in rank must be placed the genus *Troglodytes*, a species of which, the chimpanzee, *T. niger*, was placed by Linnæus in the same genus even as man. This animal is a native of Africa, and when full grown, measures from three to four feet in height.

1. *Simia Satyrus*—Orang-utang. 2. *Troglodytes niger*—Chimpanzee. 3. *Troglodytes Gorilla*—The Gorilla.

The teeth are exactly like those of man, except that they do not possess the unbroken proximity which characterize the human subject. The facial angle is 35°, and it has thirteen pairs of ribs. The fur is rigid and black; the hairs of the fore arm are reversed; hands naked to the wrist; ears large and patulous; face naked, wrinkled, and blackish; lips and chin sprinkled with short white hairs. The chimpanzees walk on the outer edge of the foot, and back of the fingers of the hand, and not on the soles as the generality of monkeys do. Their habits have not

been much observed in a state of nature, but in a state of captivity their manners have been the theme of many a tale, and much admiration. The specimens brought alive to this country have been all young, when they have been playful and good tempered; but it would appear that they become ferocious as they increase in age, and show an unteachable obstinacy and untameable fierceness. The gorilla, *T. Gorilla*, is another species to which the attention of naturalists has lately been called. It inhabits the western shores of Africa, and differs from the preceding in its greater size, and by several points in the development of its cranium. The chimpanzees live in trees upon a sort of nest formed of branches interlaced, and covered with a roof of leaves impermeable to water. The gorillas have no fixed habitation, and in wet weather content themselves with curving down their heads and remaining immovable. It is said that at the approach of the large beasts of prey, the gorilla is careful to place its young in safety, and then to come forth to do battle with the intruder. In these encounters it is generally the conqueror, and it is asserted that it will attack man himself when he comes upon it, and if not shot dead on the spot, will break the guns like straw, and tear its enemy to pieces. The natives, we are told, when they succeed in killing one, make a "fetish" of the cranium, and hold these relics in superstitious reverence. The gorilla reaches, when adult, from five to seven feet in height. Next to the troglodytes comes the genus *Simia*, which at one time included all the species belonging to the family, and to which it gives its name. The only species belonging to this genus is known by the name of orang-utan, or orang-outan. It is a native of Sumatra and Borneo. This animal, *S. Satyrus* = *Pithecus Satyrus*, or the red orang, is about five feet high when full grown, and its hair is of a reddish-brown colour. Its facial angle is 30°, and it has twelve pairs of ribs. In Borneo its native name is "mias," and it is abundant in the south and south-western districts in low swampy grounds covered with a virgin forest. In his march through these forests, the "mias" may be seen walking deliberately along the branches in a semi-erect attitude. Choosing a place where the boughs of an adjacent tree intermingle, he seizes the smaller twigs, pulls them towards him, grasps them together with those of the tree he is on, and thus, forming a kind of bridge, swings himself onward, and seizing hold of a thick branch with his long arms, is in an instant walking along to the opposite side of the tree. He never jumps or springs, or even appears to hurry himself, and yet moves as quickly as a man can run along the ground beneath. These animals sleep on trees in a sort of nest they make of leafy branches laid across one another, but seldom use the same nest more than once or twice. They do not appear to live in society, though a male and female may occasionally be seen accompanied by half-grown young ones. They live exclusively on fruits, and some of these, which they seem very fond of, are intensely bitter. The natives of Borneo assert that the mias or orang never attacks, or is

Samia satyrus—Orang-utan.

attacked by, any animal, with one exception, which is highly curious. This is the crocodile of these parts, *Crocodilus biporcatus*. They say that when the mias goes to the water's edge, the crocodile attempts to seize him, but that he gets on to the reptile's back, beats it with its hands and feet on the head and neck, and pulls open his jaws till he rips up his throat! The long-armed apes, *Hylobates* and *Siamanga*, belong also to this sub-family. They are natives of tropical Asia—see HYLOBATES. A second sub-family of the similidæ is that of the capped apes, natives of Asia, and some of them of very peculiar appearance—see PRESBYTINA. A third sub-family is that of the monkeys—see CERCOPITHECINA; and the fourth and last, is the family of baboons—see

CYNOCEPHALUS. Fossil remains of several species of animals belonging to the *Simiidæ* have been discovered in the tertiary formations of India, France, England, and Brazil. The British species belongs to the genus *Macacus*, and has been named *M. eocænus*; it was found in a bed of whitish sand, in Suffolk. That of India is referred to *Semnopithecus*, and was found in a bed of mixed calcareous sandstone and clay, in the sub-Himalayan hills near the Sutlej. The species found in France is referred to the genus *Hylobates*, a genus, the skull of which is even more approximated to that of man than the chimpanzee itself; whilst that of Brazil belongs to *Callithrix*, and must have exceeded in size the largest orang-utang or chimpanzee that has yet been seen.

Simosaurus (*σιμος*, obtuse muzzle; *σαυρος*, lizard).—A genus of fossil reptiles, the remains of which have been found in the musselchalk. The construction of the head (the part found) shows it to be intermediate between the tortoises, or chelonians, and the saurians.

Simulium.—A genus of dipterous insects. See BIBIONIDÆ.

Sinapis.—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and containing the well known plants called mustard. Between forty and fifty species have been enumerated, and of these, two have been extensively cultivated in this country. These plants, the black mustard, *S. nigra*, and the white mustard, *S. alba*, are found growing wild in cultivated fields, waste grounds, and road sides. The seeds of black mustard furnish the table mustard. They contain a bland fixed oil, a peculiar bitter principle, myronic acid, and another principle analogous to albumen, or emulsin, called myrosine. When water is added, the myronic acid and myrosine, by their combination, form a pungent volatile oil, containing sulphur and nitrogen, which gives to mustard its peculiar properties as a physiological agent. The white mustard contains more fixed oil than black mustard. It does not, however, contain myronic acid, but an analogous principle called sinapin, or sinapisin, which, by combination with another principle, forms an acrid compound, but not a volatile oil. The mustard of Scripture is the seed of a totally different plant, belonging to the genus SALVADORA.

Siphonaceæ.—A tribe of confervoid *Algæ*. The plants belonging to this tribe are of larger dimensions and higher organization than any other of the *Confervoideæ*. Indeed they are placed by some authors among the lower fucoids. They are composed of tubular cells of much larger size than those of any other group belonging to the confervoid family, the entire plant often consisting of one undivided tube, while in other cases the branches arise from true articulations. In *Botrydium* a very curious structure is exhibited. The plant consists of a tough membranous globule, filled with green matter, rising from a branched, colourless, root-like portion, spreading in the damp ground, the whole consisting of only one very large undivided cell.

Siphonaria (*sipho*, a syphon).—A genus of marine lung-breathing molluscous animals belonging to a small family, *Siphonariidæ*, but long arranged with the *Patellidæ*. The shell is like that of the patella, but the apex is rather on one side and posterior, and the scar left by the adductor muscle near the edge of the cavity is interrupted in the centre of the right side, where the breathing hole of the dorsal respiratory cavity is placed. A considerable number of species have been ascertained to exist, but chiefly in the seas of warmer latitudes. They are found between tide marks, like the limpets.

Siphonia.—In Zoology this name is applied to a genus of fossil sponges. They were at one time considered to belong to the alcyonidæ, and have accordingly received also the name of *Alcyonites*. Some of the species, which are found in a siliceous state in the chalk formation, on account of their form have been taken for fossil fruits, and called *Ficoites*. Many of these have the form of an onion or turnip, others are club-shaped; and they appear for the most part to have been fixed to rocks at the bottom of the sea, by a kind of root.

Siphonia.—In Botany this name is applied to a genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiacèæ*, and containing one species (perhaps the only one) that yields the substance called caoutchouc, or India rubber. *S. elastica* is a tree from fifty to sixty feet in height, found growing in the forests of Brazil and Guiana. It abounds in a milky juice, which exudes on incisions being made, and solidifies on exposure to the air. Large quantities of this substance are imported from Para, in South America, and from being collected in casts the shape of a bottle, is known by the name of the bottle India rubber.

Siphonostoma (*σιφων*, a tube, or syphon; *στομα*, mouth).—An order of animals belonging to the entomostracous *Crustacea*. The animals have the body composed of several articulations, and are furnished with feet adapted for swimming. The organs of the mouth consist of a large well developed sucking tube, and a pair of styliform mandibles, fitted for puncturing the skin of the animals upon which they are parasitic, and for sucking the juices of their bodies; and a pair of mandibles called jaw-feet, constructed so as to serve the purpose of prehension, or for fastening themselves to the animals upon which they live. The young do not lead a parasitic life till after they have changed their skins two or three times. It has been considered by many naturalists, that the irksome presence of these parasites drives the salmon up into fresh water rivers, in order to get rid of them. In many of the siphonostoma, their head is large and in the

form of a buckler, furnished anteriorly with frontal plates and short antennæ. They constitute the tribe *Peltocephala* (πιλη, a short shield; κεφαλον, head), and are represented by such genera as ARGULUS and CALIGUS. Other species have the head rather thick and obtuse, instead of shield-shaped, and want the frontal plates; the antennæ are much longer, and are composed of five or six articulations. These constitute the tribe *Pachycephala* (παχυς, thick; κεφαλον, head), and are represented by NICOTHOE, &c.

Sipunculus.—A genus of radiated animals belonging to the class *Echinodermata*, order *Holothurida*, and family *Sipunculidæ*. The species are cylindrical in form, have a coriaceous integument, and the anterior part of the body or neck is retractile. At the extremity of this retractile neck is placed the mouth, from which is protruded a proboscis surrounded with linear tentacles. These animals live in the sand of the sea shore near high water mark, or amongst debris of broken shells, &c. The *Sipunculi* were at one time classed amongst the worms, near *Nereis*, but their position is now better understood.

Siren.—See SIRENIDÆ.

Sirenidæ.—A family of animals belonging to the class *Amphibia*, and order MEANTIA. The species belonging to this family are truly amphibious. They are provided with both lungs and gills which are permanent during their life, and enable them to breathe atmospheric air, and at the same time fit them for extracting air from the water. *Siren lacertina*, the mud eel, is peculiar to the southern provinces of the United States. It has an elongated body nearly like that of the eel, and only one pair of feet. There are three ciliated gills on each side. They are animals which live in moist clay, rarely in water, but can swim well. *Proteus anguinus* is a native of Carniola and the Tyrol, and is about a foot long. It lives in subterranean waters, or underground lakes, and differs from the siren in having two pairs of feet, and in being much larger than any species of that genus. When the water in which it lives dries up, it buries itself in the mud. It is particularly common in the celebrated cave of Adelsberg, and is called by the people of the neighbourhood "bela riba." Some naturalists have maintained that it is only the larva of some amphibian as yet unknown, but this is disproved by the fact that ova have been found in its body. *Necturus*, or *Menobranchus*, an allied genus, contains two or three species, which are found in North America. These two genera have lately been removed from the family *Sirenidæ*, and formed into a small family by itself, *Proteidæ*. The *Axolotes* or axolotl of Mexico, is an animal that has been by many naturalists placed in this family also. Of late, however, doubts have been entertained whether it is of mature form, or only a larva state of some animal unknown. It was found by the Spaniards, at the conquest of Mexico, in great abundance in the lake which surrounds that city. It furnished men, as it does still, an agreeable and much esteemed article of food. It is dressed after the manner of stewed eels, and served up with a rich and stimulating sauce.

Sirex.—A genus of hymenopterous insects belonging to the family *Siricidæ*. The species inhabit the pine forests of the north of Europe and North America. They possess a strong, straight ovipositor, which is always exserted. In flying they produce a loud humming noise like the humble bees. They deposit their eggs in the wood of trees which the larvæ bore into, and in the burrows so formed they spin a cocoon, and undergo their transformations. *Sirex gigas* is the type of the genus, and is about as large as a hornet.

Sitaris.—A genus of beetles. See CANTHARIDÆ.

Sitta. *The Nuthatch.*—A genus of birds belonging to the tennirostral tribe of the order *Passeres*, family *Certhiidæ*, and sub-family *Sittinæ*, of which it is the type. The species are birds which live almost constantly on trees, upon which they run with great facility in all directions, often head downwards, frequently suspending themselves from the branches. They feed principally upon insects, and for the purpose of discovering them, they tap the bark of the tree with their bills so as to disturb them in their places of retreat. Their nests are formed in holes of trees, often in such as have been deserted by the woodpeckers. As these are generally too large, the nuthatch is in the habit of narrowing the entrance by plastering the mouth of the hole up with mud. *S. Europæa*, the common nuthatch, is the type of the genus, and is a well known bird. It is a native of almost all Europe, and is bold and courageous, almost constantly in motion, and very voracious. The female, when surprised on her nest, makes a most determined defence, and hisses like a serpent. Though in general the birds of this genus make their nests in the holes of trees, there is one which, on the contrary, builds in holes of rocks. This is a species found in Syria and the Levant, and is called *S. Syriaca*.

Sium.—A genus of dicotyledonous plants belonging to the nat. ord. *Umbelliferæ*, and composed of herbs peculiar to the temperate parts of the northern hemisphere. *S. latifolium* is one of the most common species. It is a native of Great Britain and other parts of Europe, and was at one time considered as an anticorbutic and diuretic. *S. Sisarum* is a species which is cultivated and used in many places as a pot-herb. In France it is known by the name of chervis, and in the north of Scotland it is called crammock. The roots are branched and knotted, white, tender, and sweet tasted. They are used either for boiling in soup, or as a vegetable for the table.

Sivatherium (*Siva*, a Hindoo deity; θηριον, animal).—A genus of extinct fossil quadrupeds belonging to the order *Ruminantia*. The head

only has been discovered, and was found in the tertiary formation of the Sewalik hills of the Himalaya range. The skull is about as large as that of the elephant, and the nasal bones are remarkable for the manner in which they are prolonged into a pointed arch above the external nostrils, indicating a trunk or proboscis. Two horns arise from the brow between the orbits, and diverge from each other, and it is probable that the posterior protuberances of the forehead also supported a pair of short massive horns. When living it must have resembled an immense gnu or antelope, with two pairs of horns. In consequence of the existence of a proboscis, it is placed by some zoologists in the family *Elephantidæ*.

Smerdis.—A genus of extinct fossil fishes belonging to the order *Acanthopterygii*, and family *Percidæ*. Several species have been found in the tertiary formations.

Smilax.—A genus of monocotyledonous plants belonging to the nat. ord. *Smilaceæ*, to which it gives its name. The genus consists of evergreen, climbing shrubs, which are natives of the temperate and warm parts of both hemispheres. The root is sometimes tuberous, sometimes fibrous, the leaves are alternate petiolate, reticulated and stipulate. The valuable medicine known as sarsaparilla, or sarza, is furnished by several species of this genus, which grow in the forests of tropical America, the West Indies, and British Guiana. The roots are the parts used, and they contain, along with mucilage and starch, a peculiar crystalline principle called salseparine, smilacine, or parigline, in which the active virtues of this medicine reside. Sarsaparilla is very much used by physicians, who regard it as an excellent vegetable alterative and a powerful sudorific. Seven or eight different species of smilax furnishing sarsaparilla are enumerated as natives of America; and one, *S. aspera*, is a native of Europe. The roots of this species are known by the name of *Sarsaparilla Italica*. *S. China*, a native of China, furnishes what is known by the name of China-root. This is used as a substitute for the true sarsaparilla, though it is considered much inferior to it.

Sodalite (*soda*, and λίθος, a stone).—A mineral substance composed of silica, alumina, soda, and chlorine. It occurs crystallized and massive; is transparent, colourless, and of a vitreous lustre. There are three varieties found. One, the sodalite of Vesuvius, in crystals, in the dolomite of Fossa grande, on Vesuvius, and colourless. Second, the sodalite of Greenland, occurring in lamellar masses in mica schist in Greenland, of an obscure green colour. Third, the sodalite of Siberia, of an azure-blue, found in the mountains of Ilmen, in Siberia.

Soja.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The beans of a species of this genus, *S. hispida* or *Japanica* (*Dolichos Soja*), a native of Japan and the Moluccas, but now introduced into the continent of India, are used to prepare the sauce called soy, imported into this country from China. Japan soy is considered superior to Chinese. The native Japanese name for it is sooja, which has been corrupted into soy.

Solanaceæ.—A nat. ord. of dicotyledonous plants, composed of herbs, under-shrubs, or trees, containing a watery juice. The leaves are alternate, entire, or lobed. The greater number of the species are natives of tropical climates, some grow within the temperate zones, but none are found in the arctic regions. In general the plants of this order possess narcotic qualities. These, in some cases, are developed in a great degree, so as to render the plants very poisonous; in other cases they are obscured by the presence of nutritious and starchy matter. In many instances, certain parts of the plant have poisonous narcotic properties, while other parts are harmless, and are used as articles of diet. The genera and species are numerous; 66 genera and 935 species having been enumerated. They are arranged by some botanists in several sub-orders, and while many are used in medicine, others furnish important articles of food. The *Nicotianeæ* contains the well known tobacco plant—see NICOTIANA; the *Datureæ* contains the well known plant called stramonium—see DATURA. The sub-order *Hyoscyameæ* contains amongst others the well known plant called henbane—see HYOSCYAMUS. The largest sub-order, however, is *Solaneæ*, containing the potato plant—see SOLANUM; the winter cherry—see PHYSALIS; the tomato, which is the fruit of *Lycopersicum esculentum*; the belladonna—see ATROPA; the mandrake—see MANDRAGORA.

Solanum. *The Potato genus.*—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and giving it its name. This is a very extensive genus, upwards of 400 species having been described. The most important, perhaps, of all, is the common potato, *S. tuberosum*. For this invaluable plant we are indebted to America, on the west coast of which it is found growing in abundance. It is most probable that the potato was first introduced into this country by Sir W. Raleigh in 1586. For a length of time they were only cultivated in the gardens of the nobility and gentry, and it was not till the year 1684 that they were planted in the open fields in England. In Scotland they were not planted in the open fields till 1728; but in Ireland the cultivation of this plant extended far more rapidly than in any other part of Great Britain. From three-fifths to four-fifths of the entire food of the people of Ireland is derived from the potato. The egg plant, mad apple, or Jew's apple, is another species of solanum, *S. melongena;* the fruit of which is about the shape and size of a small hen's egg. It is used by the French and Italians in soups and stews. The Sodom egg plant, or apple of Sodom, *S. Sodomeum*, is a species which bears a fabulous and poetical repu-

tation. The plant is shrubby, grows in the north of Africa and the south of Europe, and bears a fruit about the size of a walnut. It is also found on the shores of the Dead Sea, and the fruit is particularly liable to the attack of an insect which deposits its eggs within the germen. As the fruit enlarges, the larvæ destroy and pulverize the whole interior, leaving the rind unchanged and entire. If the fruit be gathered in this state and attempted to be eaten, it fills the mouth with a dry powder like fine ashes, and of a bitter taste. Milton and Moore have both alluded to this, and some of the earlier travellers assert that were the traveller to cut them in two, "he shall find within them coles and cyndres."

Solarium. *Staircase Shell.*—A genus of *Mollusca* belonging to the class *Gasteropoda*. The shells are of an orbicular form, depressed, with an open umbilicus and sub-quadrangular mouth. The animal has a horny operculum, which is multispiral. The spiral edges of the whirls, seen in the umbilicus, have been fancifully compared to a winding staircase. About twenty-five or thirty species have been enumerated, two or three of which have been detached of late, and formed into different sub-genera, as *Torinia*, *Omalaxis*, or *Bifrontia*. About fifty-six fossil species have been enumerated.

Solaster.—A genus of echinodermatous animals belonging to the family *Asteriidæ*. The species are distinguished by having two rows of ambulacral pores, and numerous rays, nearly equalling in length the diameter of the disc.

Soldanella.—A genus of dicotyledonous plants belonging to the nat. ord. *Primulaceæ*. Three species belong to this genus, all natives of the mountainous parts of Europe, as the Alps and Pyrenees, near the snow line. *S. alpina* is a pretty plant with violet flowers, and is cultivated in our gardens. Some of these plants are slightly purgative.

Solea.—A genus of fishes forming part of the old genus *Pleuronectes*, and containing the sole, &c. See PLEURONECTIDÆ.

Solecurtus (*solen* and *curtus*, short).—A genus of conchiferous *Mollusca* belonging to the family *Solenidæ*. The shells are elongated, rather ventricose, with sub-central beaks; margins sub-parallel; ends truncated, gaping; ligament prominent; hinge teeth, two in each valve; and the animals are too large for the shell. They live buried deeply in sand or mud, usually beyond low water, and are difficult to obtain alive. *S. strigillatus* has the shell of a rosy colour, with white zones and furrows on its surface, and is found not only in the Mediterranean, but also in Brazil, Senegal, and the Indian seas. *S. Caribæus* occurs in countless myriads on the bars of American rivers, and on the coast of New Jersey in sand exposed at low water. By removing three or four inches of sand its burrows may be discovered; they are vertical cylindrical cavities, $1\frac{1}{2}$ inch in diameter, and 12 or more deep. The animal holds fast by the expanded end of its foot. About twenty-five recent and thirty fossil species have been described.

Solemya, or Solenomya.—A genus of conchiferous *Mollusca* belonging to the family *Solemyidæ*, of which it is the only genus and the type. The species are very peculiar for being covered with a very hard cartilaginous periostraca, which is much produced beyond the edge of the shell. The shell is inequilateral, equivalve, elongated transversely and obtuse at the extremities, and gaping at each end. The hinge has no teeth, and the ligament is concealed. The animal has only one gill on each side, and the foot is proboscidiform, truncated, and fringed at the end. The mantle lobes are united behind, with a single siphonal orifice. Only four recent species are known; they burrow in the mud. Four other species occur fossil.

Solen.—A genus of shells. See SOLENIDÆ.

Solenidæ.—A family of conchiferous *Mollusca*, containing numerous species found in most parts of the world. The shells are generally elongated, equivalve, gaping at both extremities; the hinge provided with two or three compressed teeth in each valve, the posterior of which is bifid. The ligament is long, external, and the cartilages are linear, and supported on a large very prominent pad or fulcrum. At the posterior extremity the mantle is prolonged into a short tube, containing the two siphons united, and projecting beyond the surface of the sand into which they dig. The genus *Solen* is the type of the family, and the species are known by the name of the "razor fish." The hinge in these shells is nearly terminal. They live buried nearly vertically in the sand of the sea shore at extreme low water, at a little depth below the surface. They never voluntarily leave their burrows, and if taken out soon withdraw themselves again. They are excellent articles of food when cooked. Several species are found fossil.

Solenomya.—See SOLEMYA.

Solenostemma (σωλην, tube; στεμμα, crown).—A genus of plants. See ASCLEPIADACEÆ.

Solidago (*solidare*, to heal wounds, &c.).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Corymbiferæ*, and tribe *Asteroideæ*. The species belonging to this genus are numerous, about 130 having been described. They are herbaceous, with a somewhat shrubby lower stem, and are natives, for the most part, of North America, only a few, comparatively speaking, being found in Europe and Asia. They have sessile alternate leaves, entire or serrated, and yellow flowers in small heads. Some of them are cultivated in our gardens, where they produce a good effect with their yellow flowers. The typical species is the golden rod, *S. virgaurea*, a plant found growing in the wooded districts throughout Europe, northern Asia, and even in North America. The golden rod is a

bitter astringent, and was in olden times highly esteemed, and very much used by physicians as a diaphoretic and vulnerary. *S. odora*, a native of North America, is used in the United States as an astringent in cases of dysentery.

Solipedes.—A term used by some naturalists to designate a family of pachydermatous mammalia characterized by having only one apparent toe and a single hoof on each foot, such as the *Horse*, *Ass*, &c.

Somateria.—A genus of ducks. See ANATINÆ.

Sonchus. *The Sow Thistle.*—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Cichoraceæ*. A considerable number of (about forty-five) species are described, inhabitants of Europe, Asia, Africa, and America. Four of these are British, the most common, *S. oleraceus*, being found in waste places and cultivated ground all over the world. It is greedily fed upon by many animals.

Sorbus.—A genus of plants to which the mountain ash and service tree belong, according to some botanists. They are generally, however, placed in the genus *Pyrus*. See POMACEÆ.

Sorex. *The Shrew Mouse.*—A genus of insectivorous *Mammalia* belonging to the family *Erinaceidæ*. The shrews have much the general aspect of the mouse. The muzzle, however, is very much attenuated, the ears are short and rounded, and the body is covered with a soft and velvety fur. The common shrew, *S. araneus* (*Corcira vulgaris*), is about five inches long from the tip of the snout to the root of the tail, and is of a reddish mouse colour above, grayish beneath, and sometimes tinged with yellow. It is a native of Great Britain, frequents dry situations, and makes long superficial burrows in banks, amongst the roots of trees, and brushwood. Its food consists of insects, worms, and grubs, for the pursuit of which among the close herbage, and under the surface of the soil, its thin pointed snout is admirably adapted. It is a harmless little animal, but at one time was an object of fear and superstition. The body exhales a rank, musky odour, so that cats will not eat them, though they are devoured by owls and kestrels. It is a curious fact, that every autumn immense numbers of these little animals are found dead on our footpaths and roads, but the cause of this mortality has not yet been cleared up. Two other species are found in Britain, the water shrew, *S.* (*Crossopus*) *fodiens*, and the oared shrew, *S. remifer* = (*Crossopus ciliatus*). In India a species is found which is of considerable size. It is well known to the residents in that country as the musk rat, and is about the size of our common brown rat. This species, *S. murinus* or *myosurus*, diffuses a most powerful odour of musk, which impregnates everything that is touched by it. Even wine, in well corked bottles, is frequently rendered unfit for use by their running over them, the wine having a strong musky odour imparted to it. Another animal, diffusing a musky odour, and nearly allied to the genus sorex, is the desman, *Mygale moschata*. It is about seven inches long, with a tail about eight inches additional, and is found in the river Volga, and the adjacent lakes from Novgorod to Saratov. Stagnant waters, shut in by high banks, are its favourite localities, and it is never seen on dry land. Its muzzle is elongated into a small, very flexible, proboscis, which is constantly in motion; its tail is scaly, and flattened at the sides; its feet are membranous, and it excavates burrows in the banks twenty feet in length, commencing under water, and ascending to above the level of the highest floods. The desman feeds upon leeches, small fish, and larvæ of water insects, and in its turn is preyed upon by pikes and other voracious fishes, whose flesh becomes so impregnated with musk as to render them uneatable.

Sorghum.—A genus of grasses. See HOLCUS.

Sorus.—A term employed to designate the collection of sporanges of ferns, found on the edges or under surface of the fronds. It is also sometimes applied to the groups of spores in the florideous *Algæ*.

Soymidia.—A genus of plants. See CEDRELACEÆ.

Spalax.—A genus of rodent animals belonging to the order *Glires*, family *Aspalacidæ*. The species belonging to this genus are stout animals with a thick, cylindrical body, without or with only a very short hairy tail, and short feet fitted for digging, all four furnished with five toes. The head is large and flat above, and the muzzle is cartilaginous and very obtuse. They appear to have no eyes, these organs being almost rudimental, and their external ears are extremely small. They live under ground, in galleries which they hollow out with their strong fore feet. Their food consists of plants and roots, and they commit great devastation in the cultivated fields. *S. typhlus* is the type of the genus, and is known by the name of the "blind mole-rat." It is a little larger than our common rat, being about 7½ inches long, and is a native of Syria, the south of Russia, Persia, Poland, Hungary, and Greece. The mole-rats are particularly abundant in Russia, in the fertile plains where there is abundance of food. They live in society, dwelling in shallow galleries under ground, which communicate with deeper cavities where they are protected from wet.

Sparidæ. *The Sparoid Fishes.*—A family of acanthopterygious fishes, resembling somewhat in form the perches, the body being generally of an ovate form and covered with large scales. The dorsal fin is single, the anterior half supported by spinous rays and undivided. The opercular bones are not spinous or toothed, the palate is toothless, and the mouth is not protractile. These fishes feed chiefly upon small mollusca and crustacea, and their strong teeth are well adapted for crushing the hard shells of these animals.

The structure of the teeth varies considerably in the different species, and affords characters for arranging them in several groups. In one set the teeth are rounded like paving stones, as in the genera SARGUS, *Pagrus*, and PAGELLUS, numerous species of which occur in the Mediterranean; in a second, they are conical and pointed, as in *Lethrinus*, which is remarkable for having no scales on the cheeks, and DENTEX—which see; in a third set the teeth are minute, numerous, and dense as the pile on velvet, as in the genus *Cantharus*, one species of which is not uncommon on the British coasts, and is known by the name of *C. varius*, or the black bream; and in a fourth set the teeth are compressed, placed close together, and have a cutting edge more or less notched, as in the genera *Scatharus* and *Crenidens*, &c.

Spartium.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. This genus originally contained a number of species, many of which have now been transferred to other genera, as GENISTA, SAROTHAMNUS, &c. Almost the only species remaining is *S. junceum*, the Spanish broom, a very pretty shrub, a native of southern Europe. It has long, slender, rounded branches, and large, golden-yellow, sweet-scented flowers in terminal branches. A fibrous thread is obtained from it, of which cloth is made, and this plant is considered by some authors to be that used by the Romans for cordage, and called by them *Spartum*.

Spatangidæ.—A family of echinodermatous animals, belonging to the order *Echinida*, and characterized by having the mouth transverse, and placed more or less in front of the middle of the inferior surface of the shell. The series of pores form petal-like rows, both on the back and near the mouth. The shell is generally heart-shaped, and is sometimes furnished with long, slender, as well as the usual small short spines. The genus *Spatangus* is the type, and a good many species have been described.

Spatularia.—A genus of sturgeons. See STURIONIDÆ.

Species.—In the language of Natural History, a species is an assemblage of individuals, whose likeness to one another is sufficient to justify the conclusion that they all have had, or may have had, the same original parentage; whilst it is distinguished from any other species by sound definite character, so uniformly transmitted from generation to generation, that it cannot be supposed to have acquired this from the influence of any external conditions.

Spelearctos (σπηλαιον, cave; αρκτος, bear).—A genus of fossil mammalia, belonging to the order *Carnivora*, and family *Ursidæ* or bears.

Spermatozoa (σπερμα, seed; ζωον, animal).—A name given to peculiar, microscopic bodies, found in the fecundating liquor of animals and plants, and which are the fertilizing elements of this liquid. Their form varies in different animals, but they usually consist of a rounded or oval body or head, to one end of which is appended a moveable filament. Most spermatozoa exhibit active movements produced by the action of this filament, whence they were formerly considered to be independent living animals. These movements, however, are now considered to be similar to those of the ciliated zoospores of the *Algæ*. In these and other cryptogamic plants, these bodies are also known by the name of antherozoids. They are regarded as analogous to the spermatozoa of animals, and as the agents of the fertilization of the germ cell.

Spermœdia.—A name applied by some botanists to that diseased state of the seeds of rye and other grasses, produced by a fungus, and known by the name of *Ergot*—see this word.

Sphaenocephali (σφαινος, sphenoid bone; κεφαλη, head).—A genus of monsters. See OTOCEPHALÆI.

Sphæria.—A genus of acotyledonous plants belonging to the nat. ord. *Fungi*. The species are small, generally found upon decaying vegetable matters, and appear as if immersed in the substance on which they grow. They are very numerous, upwards of 600 having been described, 200 of which are British. They are generally diffused throughout the world in the temperate zones, and so abundant are they, that scarcely a decaying stick can be taken up in autumn without presenting some form of them. Though it is almost universally upon decaying vegetable matters that they are found, yet two or three species have been discovered growing from the bodies of caterpillars and other decaying animal matters. *S. sinensis*, a substance greatly valued by the Chinese as a medicine, grows from a caterpillar. *S. Robertsii* is developed on the larva of *Hepialus virescens*, a moth found in New Zealand. The body of the caterpillar, without losing its general form, is gradually converted into a solid ligneous substance. *S. Taylori* is a similar development on the body of an Australian caterpillar.

Sphæroma.—A genus of *Crustacea*. See ISOPODA.

Sphagnum.—A genus of acotyledonous plants belonging to the natural order *Musci*. These mosses are remarkable plants, with white leaves slightly tinted with red or green. They are found growing in marshy places, and form masses of turf which serve as fuel in some countries.

Sphargis.—A genus of tortoises. See CHELONIA.

Sphenophyllum.—A genus of fossil plants peculiar to the coal measures and the transition formations. These plants appear to have been herbaceous, and to have had slender, often ramified stems with verticillate leaves. They are considered to be acotyledonous plants, and to have belonged to the order *Musci*, and most pro-

bably the tribe *Marsiliaceæ*. About seven species are known.

Sphenophyllum dentatum.

Sphecidæ or **Sphegidæ**. *Sand Wasps.*—A family of fossorial hymenopterous insects, distinguished by having filiform antennæ, generally twisted in the females; an elongated abdomen, attached to the thorax by a long peduncle, a narrow body, and feet adapted for digging. The species are nearly allied to the *Crabronidæ*, and are very numerous. They are generally of considerable size, and ordinarily their colour is of a brilliant violet-blue, more or less deep, a few being banded with yellow. The females are provided with a sting like the wasps and bees. They are remarkable insects for their industry, and the care which the females take for preserving and bringing up their young. There are only two sexes in this family, male and female. There are no neuters, no workers; the female is the architect of her own nest, which is generally hollowed out of the sand, and alone takes charge of supplying her larvæ with food. This consists of living insects, which the mother brings to the nest as soon as she deposits her eggs, first stinging her poor victims so as to stupefy and not kill them. As soon as she has provisioned the cell in which the egg is deposited, she closes it up so as to prevent all access to it. The larva, when hatched, has its food ready provided for it, and grows rapidly. When it has acquired its full growth, it spins a silky cocoon in which it undergoes its transformation. The females of the genus *Pompilus* provision their nests with spiders. Generally they attack those species which do not spin webs, and which are in consequence more easily caught, but occasionally they even assault the large domestic spiders, pouncing upon them rapidly, and piercing them with their sting, as quickly to disable them. The genus *Sphex* is numerous in species. They are found scattered over all parts of the world, especially in warm climates, but only one is found in Britain. The females provision their nests with large orthopterous insects, as well as spiders. The genus *Ammophila* contains one species, *A. sabulosa*, which is about the most abundant species of the family in Europe. It is a slender, elongated insect, with a red band across the lower half of the third, the whole of the fourth, and the upper half of the fifth segment, of the abdomen. The female digs a pretty deep hole in the sand in road sides, &c, in which she deposits an egg. She then goes in search of an insect to serve as food for the larva when hatched, and after depositing it by the side of the egg, she closes the entrance to the cell, and proceeds to dig another hole for the purpose of depositing another egg. The insects this species selects as food for her young, are the larvæ of moths. The genus *Chlorion* contains several species, natives of India and Madagascar. See CHLORION.

Sphenopteris.—A genus of fossil acotyledonous plants belonging to the order *Filices*. They have pinnated fronds; the leaflets are cuneiform, truncate, or rounded, and have fan-

Sphenopteris Hœninghausii.

shaped dichotomous nervures, which give the plants a peculiar aspect. About 100 species have been described, and the greater number are peculiar to the coal measures.

Spherulites.—A synonym of RADIOLITES. See HIPPURITIDÆ.

Sphex. *The Sand Wasp.*—See SPHECIDÆ.

Sphingidæ. *The Sphinx family*, or *Hawk-Moths.*—A family of insects belonging to the order *Lepidoptera*. The species of this family are amongst the most robust and powerful of all the lepidopterous insects. Their body is thick and stout, their wings narrow, and more solid than usual amongst the lepidoptera, the nervures running along them being very strong. Their flight is very rapid, and they can when they choose hover over one spot for a length of time without their wings manifesting any other movement than a rapid quivering. In general they have a very long proboscis, by means of which they are able to extract the honey from the flowers. This family is very numerous in species, from 130 to 150 having been enumerated. They

are for the most part natives of warm and moist countries. Some of them are very large, measuring across the extended wings nearly half a foot. They are handsome insects, often very agreeably coloured. Their habits are more nocturnal than diurnal, though some of them fly in midday during the brightest sunshine. The caterpillars of the sphingidæ are very massive, and the last ring of the abdomen is furnished with a kind of spur. Their body is generally spotted with various colours, and they are found living on shrubs and trees. When disturbed, they raise the anterior part of the body in a menacing manner, an attitude which was thought to recall the *Sphinx* of fable, and which gave them their name. They undergo their transformations in the ground, some of them hollowing out a simple cell, others secreting a silky matter and forming a kind of cocoon with it mixed with dry leaves and other foreign substances. There are a considerable number of genera in this family, of which the genus *Sphinx* may be taken as the type. The best known species of this genus is *S. ligustri*, the privet hawk-moth, the larva of which feeds upon the *Ligustrum album* or common privet. The genus *Acherontia* contains the well known death's head moth. See ACHERONTIA. Amongst the most beautiful species are several belonging to the genus DEILEPHILA—which see.

Sphinx. *Hawk-Moth.*—See SPHINGIDÆ.

Sphyræna.—A genus of acanthopterygious fishes, forming the type of the family *Sphyrænidæ*. One of the most remarkable species of this genus is the fish known in the West Indies by the name of the *Barracuda*. Its flesh in general is good, but at certain seasons it becomes highly poisonous. The symptoms produced are very peculiar. A general trembling over the whole body, violent pains in the head, nausea, vomiting, and severe pains in the joints of the arms and hands, often followed up by the loss of the hair and nails. These symptoms seldom become fatal but last a long time.

Spicula.—Curiously shaped microscopic bodies found in many of the invertebrata, forming a rudimental external skeleton, and giving firmness to the body of the animals. They are met with of all form in sponges, and in them consist of silex. They occur also in the echinodermata, the foraminifera and mollusca, and in all these classes of animals consist of calcareous matter. They are now generally considered as analogous to the elements of shells.

Spigelia.—A genus of dicotyledonous plants belonging to the nat. ord. *Loganiaceæ*, suborder *Spigelieæ*. The species of which the genus is formed are shrubs or herbs peculiar to tropical America and the warm parts of North America. The leaves are opposite, connate, and dilated at their petiole. About thirty or forty species are known. *S. anthelmintica*, annual worm grass or Guiana pink root, is a native of Brazil and Guiana, and is cultivated in the West Indies. It possesses powerful narcotic properties when it is fresh, and proves very fatal to the cattle which browse upon it. It is asserted that the negroes know its poisonous effects, and at one time they were said to have employed it for the purpose of killing their masters. In small doses it acts well as an anthelmintic, and in consequence is called by the colonists in Brazil, "yerba de lombrices." *S. Marylandica*, Maryland worm grass or Carolina pink root, is a native of all parts of North America, stretching from Pennsylvania and Maryland to Florida. It has much the same properties as the preceding, but is less energetic. It is used as an anthelmintic, and its root, which is the part most employed, is also an astringent. This species is often cultivated in our gardens as an ornament.

Spilanthes (σπίλος, a spot; ἄνθος, a flower). —A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, and sub-order *Corymbiferæ*. The species are herbs with opposite entire leaves, and yellow flowers. They are natives of tropical climates, particularly South America. A good many species have been described, amongst which *S. acmella*, a native of India, is remarkable for its power of producing an increased flow of saliva, even to the extent of salivation. It is accordingly employed in cases of enlarged salivary glands, and for strengthening the gums. *S. oleracea*, a native of South America, has a piquant, peppery taste, and the leaves have been used as a condiment. They possess also, like the preceding, a sialagogue property. It is reckoned a good antiscorbutic, and is recommended as a substitute for *Cochlearia*.

Spinacia.—The genus of plants to which the well known pot-herb called spinage belongs. See CHENOPODIACEÆ.

Spinell.—A mineral substance occurring in crystals. Spec. grav. 3·523; hardness 8. Of various colours, and composed of silica, alumina, magnesia, and a trace of lime. There are several well known varieties. The red spinell, or the ruby spinell of lapidaries, of a scarlet-red colour, owing to the presence of chromic acid. The balas ruby, of a rose-red colour, and constituting one of our most precious stones. It is much esteemed on account of its hardness and brilliant lustre. The crystals are generally small, and sometimes they pass for the Oriental ruby. They are found in sand in the rivers of Ceylon, Mysore, and Pegu. Blue spinell, from America, Ceylon, near Naples, &c., of a smalt-blue colour. Green spinell, of a pistachio-green colour, found in Finland, in the Oural Mountains, the United States of America, &c. Black spinell or pleonaste, of a greenish or velvety-black colour, opaque, or only translucent at the edges. This variety is also called ceylanite. It is found in America, and at Somma near Vesuvius.

Spiracles or **Stigmata.**—The external orifices of the tracheæ of insects and spiders. The tracheæ or respiratory tubes of these ani-

mals have no communication with the mouth, but terminate externally in orifices situated upon the surface of the thorax or abdomen.

Spiraea.—A genus of dicotyledonous plants belonging to the nat. ord. *Rosaceæ*. The species are herbaceous or somewhat shrubby, and peculiar to the temperate parts of the northern hemisphere. The leaves are simple or pinnate, with double stipules adhering to the petioles, and white or rose coloured flowers. About sixty species are described, amongst which the best known is *S. ulmaria*, a native of Great Britain and other parts of Europe; in England, known by the name of "meadow sweet," or "queen of the meadows;" in France, "reine des prés." The smell which the flowers exhale is remarkably sweet, and when these are steeped in wine they are said to give it the taste of *Malmsey*. In olden times, when it was the custom to strew floors with rushes and flowers, the meadow sweet was in high estimation. *S. filipendula* is another native species, and has its roots terminated in ovoid tubercles. These contain a sufficient quantity of starch to make them useful, in times of scarcity, as an article of food. Pigs are fond of them. The plant itself is astringent, and has been used for tanning skins. Several species are cultivated as ornamental plants.

Spirifer.—A genus of fossil *Mollusca* belonging to the class *Brachiopoda*, and nearly allied to the *Terebratulæ*. The species are numerous, about 200 having been described.

Spirillum.—A genus of minute organisms. See VIBRIO.

Spirolina.—A genus of minute animals belonging to the class *Foraminifera*.

Spiroloculina.—A genus of minute animals belonging to the class *Foraminifera*, and family *Miliolidæ*.

Spiroptera.—A genus of *Entozoa* or intestinal worms belonging to the order *Nematoidea*, and family *Filariidæ*. Several species are mentioned, but there is one of them, *S. hominis*, which is a parasite of the human body. In the males the tail is spirally twisted, and furnished with membranous or vesicular wings or expansions.

Spirorbis.—A genus of annelides belonging to the order *Tubicolæ*. The shells are spirally twisted in a flat form, and adhere to other substances. They are always solitary, and generally very small. Several species are British.

Spirula.—A genus of dibranchiate cephalopodous *Mollusca* belonging to and forming the type of a small family, *Spirulidæ*. The shells are white, thin, transparent, nacreous internally, cylindrical, many-chambered, and partially twisted into a discoidal spire, the whirls of which are separate. The chambers are concave outwardly, and traversed by a siphon. The animal belonging to this shell is a decapod. The greater part of its body, covered by a sac or mantle, is external to the shell, which is placed vertically in its posterior extremity. The body is oblong, with minute terminal fins, and the arms have six rows of very minute cups. The delicate shell of the spirula is scattered by thousands on the shores of New Zealand; it abounds on the Atlantic coasts, and a few specimens are yearly brought by the gulf stream and strewed upon the shores of Devon and Cornwall. Only two or three perfect specimens of the animal, however, have as yet been obtained.

Spondias.—A genus of plants, from two or three species of which are obtained the fruit called hog plums. See ANACARDIACEÆ. The species yielding these, *S. purpurea* and *S. mombin*, &c., are natives of the West Indies. There is another which grows abundantly in the Society and Friendly Islands, and is now cultivated in the Isle of France, where it is known by the name of "arbre de cythére." The fruit is about the size of an orange, and is called "pomme de cythére." It has an agreeable, slightly acid, taste. The wood is white and hard, and the natives of the South Seas use it for making their canoes. From the bark exudes a resin, which they likewise use for pitching their vessels.

Spondylus. *The Thorny Oyster.*—A genus of conchiferous mollusca allied to the *Ostreidæ*, but according to some naturalists forming the type of a small family, *Spondylidæ*. The shells are rough and spiny externally, and are attached by the right valve. The inferior valve has a triangular hinge-area, large, flattened, and remarkable, which increases in size by age, and is divided longitudinally by a furrow. The hinge has two strong, incurved, interlocking teeth in each valve, and the cartilage is received in a central pit. The inner shell layer is very distinct from the outer, and water cavities are common in the inner layer, the border of the mantle having deposited shell more rapidly than the umbonal portion. The species are numerous, about thirty recent ones having been described. They are known by the name of thorny oysters. Upwards of forty fossil species have been described.

Spongia. *Sponge.*—See SPONGIDÆ.

Spongiidæ.—A family of animals forming a class by themselves, and called *Porifera*. This family is composed of those substances called sponges, and to which the well known sponge of commerce belongs. For a long time it was a disputed point whether sponges belonged to the animal or vegetable kingdom, and it is only of late years that the evidence has preponderated in favour of their animal nature. They consist of a soft gelatinous mass, mostly supported by an internal skeleton composed of reticularly anastomosing horny fibres, in or among which are usually imbedded siliceous or calcareous spicula. They vary much in form, and are for the most part fixed by a kind of root at the base, or they encrust other bodies. They are mostly marine, only a few being natives of fresh water. In the living state they possess lively colours, and usu-

ally grow in groups upon rocks, shells, polypes, sea-weeds, crustacea, &c. The horny fibres forming the skeleton of sponges are cylindrical and variously united, so as to form a coarse network with rounded or angular microscopic meshes. The gelatinous substance covering this skeleton resembles somewhat that of which the *Amibæ* are composed, and apparently consists of minute masses,—those on the surface being furnished with long and very slender vibratile cilia. During life, by means of these, water entering by the smaller apertures, and reaching the osculer channels, is expelled from the oscula in currents. Sponges are propagated by division; when cut in two, the portions will each grow and become perfect sponges. They are also, and more usually, propagated by gemmules, which sprout from the delicate granular film covering their skeleton; and which, gradually becoming detached from the parent body, are furnished with cilia, swim freely about, and afterwards, finding a favourable locality, become fixed and gradually enlarge into sponges. The sponges of commerce are obtained in considerable quantities from the Mediterranean, and are usually prepared by soaking in dilute hydrochloric acid, in order to remove all traces of lime, and then bleached and well beaten to render them fit for market. The inhabitants of some of the Greek islands have been trained from their infancy to dive for these substances. They adhere firmly to the bottom, and are not detached without a great deal of trouble. Smyrna is the great market for sponge. There are three kinds of sponges, each of which is composed of many species, and form as many orders or divisions. The horny sponges, *Cornea*, have no spicula, and have the body very porous and elastic, soft, and composed of a fibro-corneous skeleton, which anastomoses in all directions. The genus *Spongia*, which contains the sponge of commerce, is the type. The siliceous sponges, *Silicea*, have the body more or less rigid or friable, and strengthened with siliceous spicula. The genus *Thethys* is the type. The calcareous sponges, *Calcarea*, have the body, which is not very soft, and composed of a sub-cartilaginous substance, supported by calcareous spicula. The genus *Grantia* is the type.

Spongilla.—A genus of sponges which inhabit fresh water. Two species are British, and are found attached to stones, old wood-work, &c., in still or slow running streams.

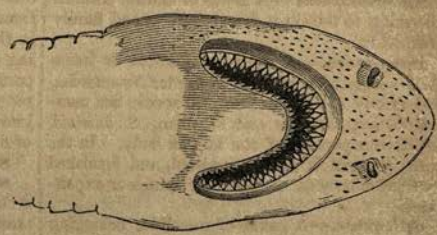
Sporangium (*σπορα*, seed; *αγγος*, a vessel).—A name applied to the structure which contains the spores of the cryptogamic plants.

Sporendonema.—A genus of acotyledonous plants belonging to the nat. ord. *Fungi*, and tribe *Mucedines*. There are two species common in this country, *S. casei*, the red cheese mould, found on cheese, and *S. muscæ*, the fly mould, which is so often seen on the bodies of flies in the autumn. This is one of the few instances of plants parasitic upon animals.

Sporidia (*σπορα*, seed). *Spores.*—The organs which represent in cryptogamic plants the seeds of the flowering plants.

Sporocarpium (*σπορα*, seed; *καρπος*, fruit).—A term applied to the particular form which the sporanges assume in the *Marsileaceæ*. It is intended to express a combination of sporanges placed near together, and more especially when these are enclosed in a common membrane.

Squalidæ. *The Shark family.*—A family of fishes belonging to the order *Chondropterygii*, and composed of numerous species known by the general name of sharks. In anatomical structure, the fishes of this family nearly correspond, more especially in the formation of the branchiæ, with the rays—see RAIIDÆ. The females are larger than the males, and are ovoviviparous. The eggs are in general contained in a hard, horny, semi-transparent case, of an oblong form, with a long tendril attached to each corner. A few, however, have eggs which have no such case; and these are received into the oviduct of the mother, which in this case becomes a sort of uterus in which the young are developed. The teeth are varied in form in the different species. They are arranged in several series, one within another, the outermost being that in use. Generally they are large and in the form of an isoceles triangle, sometimes smooth, sometimes finely toothed on their outer margin. The form of the body differs much in the different genera. They are characterized, however, in general by having a rounded body, terminated by a large, conical, fleshy tail. The pectoral fins are small. The



Head of Shark.

ventrals are placed at a distance from the pectorals, and near the anus. They have two dorsal fins, and an anal under the base of the tail. The tail terminates in the caudal fin, the upper lobe of which is generally larger than the lower, and almost always bent upwards at an obtuse angle with the body. The mouth is large, and the snout projects beyond it; so that when the shark is going to seize its prey, it is obliged to turn on one side, or on its back, should the object be a large one. Sharks are extremely voracious, devouring indiscriminately almost every animal substance, whether alive or dead. They swim

also with amazing velocity, outstripping the swiftest ships, and playing around them as if they were at anchor. The skin is usually rough, and covered with a multitude of little osseous tubercles. That of some of the species forms what is called *Shagreen*. This family contains a considerable number of genera, dependent upon the form of the nostrils, the position of the fins, &c. The genus *Carcharias* may be taken as the type, three or four species of which are British. *C. vulgaris*, the white shark, in size and voracity is the most formidable of all the species. It is an inhabitant of most parts of the globe, though generally met with in the warmer latitudes. It attains sometimes the length of from twenty to thirty feet, and its mouth is sufficiently wide to receive the body of a man. In the river Hooghly, below Calcutta, I have seen one swallow a bullock's head and horns entire. They are the dread of sailors, who give them no quarter whenever they can catch them. The blue shark, *C. glaucus*, is a more slender and elegantly formed species than the white shark, and is the most beautiful in point of colour of all the sharks. It grows to the length of eight feet, is a native of most parts of the globe, and is a very voracious and bold fish. Its chief food consists of herrings, shads, and tunnies, and it frequents several of the British coasts, especially that of Cornwall during the pilchard season. The fox-shark, or the thresher, *C. vulpes*, is remarkable for the great development of the upper lobe of the caudal fin or tail into which the vertebral column is prolonged. In fact it is nearly as long as the whole body, and from the power with which it can use it, it derives its English name. It is not unfrequently met with on our coasts, and grows to the length of twelve to fourteen feet. The hammer-

Zygæna vulgaris—Hammer-headed Shark.

headed shark, *Zygæna vulgaris*, is remarkable for having the sides of the head greatly produced in a horizontal direction, so as to resemble a double-headed hammer. The eyes are situated at the extremity of each prolongation, and are large. It is a native of the Mediterranean and Indian Seas, and is almost as voracious and formidable as the white shark itself. The species of shark commonly called the dog-fish, belong to the genus *Scyllium*. Three of these, the small-spotted dog-fish, *S. canicula*, the large-spotted dog-fish, *S. catulus*, and the black-mouthed dog-fish, *S. melanostomum*, are found on the British coasts. Another species of shark belonging to the genus *Galeus*, the picked shark, or common tope, *G. acanthias*, is also found on our coasts. It is common on the shores of Scotland, where it is taken in order to be prepared for sale by splitting and drying, and is then much used as an article of food among the poorer classes. It is easily known by its having a very strong long spine, situated before each dorsal fin, and connected at the base with the fin itself. The genus *Squatina* is distinguished from all the others by having the mouth placed at the apex of the muzzle, and not underneath it. The eyes are dorsal, not lateral, and the head is round. The muzzle is obtuse, and the pectoral fins are large and project forward. The body is broad and depressed, in this resembling the rays, but they have the branchial openings lateral, and situated between the head and the pectorals. *S. lævis*, the angel-fish, is of considerable size, of a bluish-gray above, and white beneath. Its pectoral fins are very wide, white, sometimes bordered with brown, and producing a bright effect, strongly in contrast with the bluish shade of the back. The flesh is white, coriaceous, and tasteless. Its skin is used to polish wood and ivory, &c., and at one time its flesh was held in high estimation, though now it is reckoned rank and coarse. The angel-fish is met with on many parts of the British coasts, swimming close to the bottom, or often hiding in the loose soft soil, and is exceedingly fierce, voracious, and dangerous to approach.

Squamæ. *Scales.*—In fishes scales form an important part of their dermal system. They are composed of horn or bone, and generally consist of concentric layers. Each scale is secreted like a tooth in a depression or pocket of the skin, to which it adheres under the cuticle. They are usually imbricated, with the posterior end extruded and free. The form of the scales was considered by Agassiz to bear so strong a relation to the rest of the structure of fishes and their general economy, that he founded upon it his primary divisions of the class. These divisions, according to his arrangement, are four, and seem well adapted for characterizing fossil fishes, but are so variable that they fail to define properly natural groups of recent species. The four groups are—1. *The Cycloid order* of fishes, in which the scales are composed of concentric layers of horn or bone, without spinous margins, and not covered by enamel. Most commonly they are imbricated, but occasionally they are placed side by side in contact, but not overlapping. This order has a considerable correspondence with the *Malacopterygii* of authors. 2. *The Ctenoid order*, in which the scales are composed of horny or unenamelled bony scales, with spinous teeth on the posterior edges of the layers, like a comb. They are for the most part imbricated. 3. *The Ganoid order*, in which the plates or scales are covered by a thick coat of enamel, and are sometimes of considerable dimensions. In many of the extinct species, and these form by far the largest part of the order, the enamelled plate is rhomboidal, with a hook at its anterior angle, which assists it in its place. The recent species, however, do not

form a natural group in this order, and ... two preceding also, there are scaleless fishes associated with them. 4. *The Placoid order;* these fishes have the skin covered with irregular plates of hard bone, varying greatly in shape and size. In some, as in the rays and monk-fish, they form large, rough, or spinous tubercles; and in others, as the dog-fish, they form a fine grained shagreen. This order corresponds with the *Chondropterygii* of most authors, and includes species with a smooth skin.

In Botany the term scale is applied to parts which, strictly speaking, are not bracts or leaves, and are arranged upon plants in the same manner as the scales of fishes, &c.

Squilla. *The Mantis Crab.*—A genus of *Crustacea.* See STOMAPODA.

Stachys (*σταχυς*, a spike).—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, composed of herbs or under-shrubs, which are found spread over almost all the globe, except Australia. The species are numerous, above 100 being enumerated, and several of them, as *S. germanica, S. Betonica* (= *Betonica officinalis*), *S. sylvatica, S. palustris*, &c., are natives of Great Britain.

Stagmaria (*σταγμα*, a dropping fluid).—A genus of plants, yielding an excellent varnish. See ANACARDIACEÆ.

Stalactite (*σταλαζω*, to drop).—Long masses of carbonate of lime suspended from the roofs of caverns, &c., in limestone rocks, are called *Stalactites.* The water containing carbonate of lime held in solution by carbonic acid, trickling through crevices, gradually loses its carbonic acid by exposure to the air, and deposits its carbonate of lime. The water continuing to trickle over the portion first deposited, gradually adds to it, and eventually gives it its great length and stalactitic character. Caverns are sometimes nearly filled with these deposits. The most remarkable instances of stalactites in Britain are in the Cavern of Castleton in Derbyshire, and Macallister's Cave in the Isle of Skye.

Stalagmite (*σταλαγμα*, a drop).—When the water which contains carbonate of lime in solution drops on to the bottom of a cavern before it has time to deposit its earthy matter, the flatter mass so formed receives the name of *Stalagmite.*

Stalagmites (*σταλαγμα*, a drop).—A genus of dicotyledonous plants belonging to the nat. ord. *Clusiaceæ* or *Guttiferæ.* One of the species belonging to this family, a tree growing in the island of Ceylon, yields a true gamboge, which is employed in commerce.

Stamina. *Stamens.*—The fertilizing organs, producing the pollen, and surrounding the pistil in perfect flowering plants, or occurring in the centre of the barren flowers of the monœcious or diœcious genera, are called stamens. They vary in number from one to many hundreds, and are by modern botanists considered to be modified ..., ...mbling them in their structure, development, and arrangement.

Stapelia.—A genus of dicotyledonous plants belonging to the nat. ord. *Asclepiadaceæ*, containing about ninety species peculiar to Africa, and for the most part natives of the Cape of Good Hope. They are succulent, branched plants without leaves, frequently covered over with dark tubercles, giving them a very grotesque appearance. From their quadrate, fleshy branches, at irregular points, spring fine large flowers, of a peculiar aspect, and generally spotted or marbled with a deep red-brown. Some of them exhale a very strong odour of decomposing animal matter, like carrion, and have hence received the name of carrion flowers. *S. hirsuta*, the hairy stapelia or carrion flower, possesses a very large flower of a dark chocolate-crimson colour, streaked with yellow. The smell of this plant is so like carrion, that flesh flies deposit their ova in the flower. When the larvæ are hatched they are starved for the want of food. This plant is a native of the Cape of Good Hope, and was one of the earliest species brought to Europe by the Dutch. Several other species, remarkable for their singular and beautiful flowers, are frequently cultivated in our greenhouses. They resemble in general appearance some of the cactuses and euphorbiæ.

Staphylea (*σταφυλη*, a bunch of grapes). *The Bladder Nut.*—See STAPHYLEACEÆ.

Staphyleaceæ.—A nat. ord. of dicotyledonous plants, composed of shrubs, with opposite, pinnate leaves, having stipules and stipels. The species are not numerous, but are irregularly scattered over the globe, being found in Europe, America, and Asia. The genus *Staphylea* is the type of the family. The species composing this genus are shrubs, which are chiefly found in the temperate parts of North America, though one is a native of Europe. This species, the common bladder nut, *S. pinnata*, is a native of the south of Europe, and appears to have almost naturalized itself in Yorkshire. The seeds are contained in a bladder-like capsule, a circumstance from which the genus derives its English name. They are eatable, and are said to act as a mild aperient. When fully ripe, they become so hard that in Roman Catholic countries they are often used for making beads; and in France this plant is sometimes called "patrenotrier."

Staphylinidæ.—A family of pentamerous *Coleoptera*, of which the genus *Staphylinus* is the type. This genus contains upwards of 100 species. In general they have the head large and flat, strong mandibles, short straight antennæ, the intermediate feet distinct at the base, and the posterior tarsi cylindrical. They are found in all parts of the world, and are usually found under dead leaves, in refuse, dung, &c. One of the most common and best known species is *S. (Ocypus) olens*, a very characteristic species of the family, and commonly called in this country "the devil's coach-horse."

Staphylinus. — A genus of beetles. See STAPHYLINIDÆ.

Statice (*στατικη*, to stop; the plant being supposed at one time to stop hæmorrhage). *Sea Pinks.* —A genus of dicotyledonous plants belonging to the nat. ord. *Plumbaginaceæ*, consisting of herbs and under-shrubs, which grow abundantly in the south and east of Europe, in Central Asia, and, though rarely, in Australia. The leaves are usually radical, and the flowers generally form unilateral panicles on the branches of a naked stem. Each flower is accompanied with two or three bracteæ. The statices form a marked feature in the flora of our coasts. There are seventeen or eighteen species growing in Europe, and are generally found on sands covered at very high tides. *S. Limonium*, the sea lavender, is one of the most common species, and is a native of Britain, along with two or three others. A species found in Carolina, *S. Caroliniana*, is a powerful astringent. The root is the part used, and is applied to apthæ of the mouth and fauces. It has been employed with success in putrid sore throat.

Stauntonia (after *Sir George Staunton*).— A genus of dicotyledonous plants belonging to the nat. ord. *Menispermaceæ*. The species of which this genus is composed are large climbing shrubs, with alternate, petiolate, peltately digitate leaves, and fragrant white flowers, tinted with purple externally. They are common to both China and the Himalayas, and this fact has afforded some useful inferences respecting the districts where the tea plant might be successfully cultivated. The Indian species are found in Nepâl, and in latitude 30° north, at elevations of 5,000 or 6,000 feet. Their fruit is a berry, which when ripe is large, of a purple colour, and possesses a sweetish pulp. They are eaten by the natives.

Steatite (*στεαρ*, fat). *Soap-stone.*—A mineral, consisting of silica, magnesia, and water, with a little alumina. It occurs in greenish-white, yellowish, or variegated masses, soft at first, and then soapy to the feel. Specific gravity 2·411 to 2·396; hardness, 1 to 1·5. It is found plentifully in Baireuth, Saxony; in Cornwall, in Scotland, and in the United States. It can be easily cut with a knife.

Steatornis. *The Guacharo Bird.* — See CAPRIMULGIDÆ.

Stellaria (*stella*, a star). *The Chickweeds.* —A genus of dicotyledonous plants belonging to the nat. ord. *Caryophyllaceæ*. It is composed of herbs, which are spread over a great portion of the globe, some of them of a diffused growth, others climbers; some smooth, others rough and scabrous. Several species are natives of Great Britain. They are slender, rather graceful plants, some of them possessing large white flowers, and they are found growing in woods and waste places, hedge sides, ditches, &c., in great profusion. *S. media*, or common chickweed, occurs almost everywhere, and is a favourite plant with small birds, which eat it greedily. It forms a little article of commerce in London, for pet canary and other singing birds.

Stellio.—A genus of reptiles belonging to the order *Saura*, and family *Agamidæ*. The animals belonging to this genus have a depressed body, with a longitudinal plait on each side; the scales of the back are unequal, the throat lax, with a posterior cross fold, and the tail is covered with rings of large spinous scales, and is long and pointed at its extremity. The head is elongated, and a little flattened above, and the ears are encircled with small groups of spines. *S. cordylina* or *vulgaris*, the common stellion or hardun, is the best known, and may be taken as the type of the genus. It is a native of the whole of the Levant, but is more especially common in Egypt, Syria, and the islands of the archipelago. From the tip of the muzzle to the end of the tail, it measures about a foot in length. It is generally found in old ruins, clefts of rocks, and in holes which it excavates for itself. It is exceedingly nimble, and lives on insects. Formerly, and perhaps it may be the case still, the Egyptians collected the excrements of this lizard, and used it in the composition of some of their pharmaceutical preparations, and even as a cosmetic.

Stemmata.—In insects, this word is used to designate three smooth, hemispheric dots, generally seen on the top of the head, and chiefly observable in the hymenoptera. They are sometimes called ocelli. In worms, the term is applied to the simple and minute eyes found in these creatures; and generally throughout the lower animals, to those simple eyes which are added to the large, compound eyes.

Stenorhynchus. *The Sea Leopard.* — See PHOCIDÆ.

Stentor.—A genus of microscopic animals belonging to the class *Infusoria*, and family *Vorticellinæ*. The species belonging to this genus are amongst the largest of all the infusoria, and are remarkable for their form, which is like that of a trumpet. Their body is covered with vibratile cilia, and the anterior portion of it is widened and fringed with a marginal row of longer cilia, with another spiral row of cilia extending from it to the mouth. They are very changeable in appearance, fixing themselves at one moment by their slender posterior extremity, and at the next letting go their hold, and swimming freely by means of their vibratile cilia. The movement of the long cilia on their anterior edge causes a sort of whirlpool in the water, which attracts the particles floating in the liquid to their mouth, into which they are taken, and from which they may be seen passing into the interior of the body. These animalcules are found exclusively in stagnant fresh water. *S. Mulleri* is a species which has long been known to microscopic observers, and is often described by them under the name of the "trumpet animalcule." It is white, semi-

transparent, and forms a beautiful object under the microscope.

Stephanoceros.—A genus of microscopic animals belonging to the class *Rotatoria*, and family *Floscularieæ*. It contains only one species, *S. Eichhornii*, which is remarkable for using the lobes of its rotating organ to catch its prey, in the same manner as the fresh water *Hydra* does.

Stercorarius (*stercus*, dung).—A genus of gulls. See LARIDÆ.

Sterculia (*stercus*, name derived from the bad odour some of the species exhale).—A genus of dicotyledonous plants belonging to the nat. ord. *Sterculiaceæ*, and sub-order *Sterculieæ*. The species are trees of considerable size, and are natives of the tropical parts of the world, with simple or compound leaves, with lateral deciduous stipules, and axillary panicles or racemes of apetalous flowers. Some of the species are mucilaginous, and others, as *S. guttata*, a native of the coast of Malabar, yield a fibre, prepared from the bark, which the natives employ in making a kind of cloth. Some, as *S. Tragacantha* or *pubescens*, a native of Sierra Leone, yield a gummy exudation which resembles gum tragacanth, and is often substituted for it. Several others furnish seeds which are edible. Those of *S. acuminata*, a native of the western coast of Africa, are known by the name of kola, and are much esteemed by the inhabitants of that coast. They are used by them to sweeten water, and a portion of one of them is taken before each meal, as the people believe that it increases the flavour of anything they may subsequently eat or drink.

Sterna, Sternina. *The Terns.*—See LARIDÆ.

Stigmaria (*στιγμα*, a mark or impression).—A genus of fossil plants found in the coal measures, occurring generally in the bed called the underclay. These plants are remarkable for the

Stigmaria ficoides.

uniformity of their characters; so that though specimens abound, they seem to belong almost all to one species, *S. ficoides*. The stems are cylindrical, sometimes depressed, in general simple, but having their surface marked by numerous cicatrices. According to some botanists, they are nearly allied to the genus *Sigillaria*, or indeed the roots of these very plants themselves. There are no plants of the present day which resemble stigmarias, though other botanists have referred them to such genera as *Cactus* or *Euphorbia*.

Stigma.—In Botany the *Stigma* is that part of the pistil of flowering plants upon which the pollen rests. It is a cellular, secreting body, and at the period of fertilization exudes a viscous fluid, which retains the grains of pollen, and thus causes the protrusion of the pollen tubes. In Zoology the term *Stigmata* is synonymous with SPIRACLES.

Stilbite (*στιλβω*, to shine).—*Desmine* or *Foliated Zeolite*. A mineral substance composed of silica, alumina, lime, and water. It is white and glassy, with a nacreous lustre, and is fragile. It is found in primary rocks, trap, basalt, and true volcanic rocks, in Scotland, Sweden, Kerguelen's Land, Nova Scotia, and the Ghauts.

Stillingia.—A genus of dicotyledonous plants belonging to the nat. ord. *Euphorbiaceæ*. The species are trees and shrubs, which abound in a milky juice, and grow in the tropical parts of Asia and America. One of them is of great interest. This is the tallow tree, *S. sebifera*, a tree about the height of a pear tree, growing on the banks of rivulets in China. The seeds are covered with a delicate snow-white substance; and from this and the seeds themselves, a kind of tallow is procured which the Chinese manufacture into candles. The seeds, after being steeped for ten or fifteen days in water, are subjected to pressure. The oil drops from the press like thick glutinous lamp oil, which soon hardens to the consistence of tallow. Or it may be procured from the seeds by boiling them, and skimming off the oil as it rises. These candles are white, but they are generally coated outside with wax and coloured with vermilion.

Stipa.—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*. The species are grasses, which grow in the temperate parts of the globe, and are numerous, about sixty having been described. Amongst them is one of the most elegant of all the grasses. This species, *S. pennata*, the feather grass, is found growing upon rocks and arid hills in different parts of Europe and in Siberia. It is a native of England, but not very common. It occurs in tufts, with stiff, rolled up leaves, and has a very long twisted awn, the upper two-thirds of which are elegantly barbed with silky plumes.

Stipula.—At the base of the petiole in many plants, we see leafy productions which are called by botanists *Stipules*. They resemble leaves, but are readily distinguished by their being always placed at the base of the leaf-stalk. They do not occur in all plants, but they are important as

supplying characters in certain natural orders. Plants with stipules are called *stipulate*, those without them, *exstipulate*.

Stizolobium (στιζω, to prick; λοβος, a pod). —A genus of plants, the species of which are now for the most part arranged under the genera DOLICHOS and MUCUNA. In addition to the plants mentioned under these names, we may here mention the *Stizolobium (Mucuna) utile*, which is universally used in the islands of Mauritius and Bourbon for enriching the soil for the cultivation of sugar.

Stomapoda (στομα, mouth; ποδς, foot).—An order of podopthalmous or stalk-eyed *Crustacea*. The *Stomapoda* are distinguished from the *Decapoda* by their wanting internal branchiæ or gills. These organs, when present, are external, and generally spring from the basal joint of the abdominal false feet. Sometimes they are fixed at the base of the thoracic feet, and are suspended under the thorax. In some cases they are either rudimentary or are entirely wanting. The head is distinct from the thorax. The carapace varies in form and size, sometimes covering the whole thorax, or at others only part. The abdomen varies much in appearance also. In general, it resembles that part of the body in the *Macroura*, and terminates in a caudal fin which fits them for swimming. In some cases, however, it is nearly rudimentary. The organs of the mouth are in general composed of a superior and inferior lip, one pair of mandibles, two pairs of jaws, and only one pair of foot-jaws, which are occasionally absent altogether, or are changed into swimming feet. The feet are seven or eight pairs, and in most of the species are placed near the mouth, or are folded upon it—hence the name. In some genera of this order, the thoracic feet are slender, resemble in form each other, and are all formed for swimming. In others, the first pair are large and prehensile, and the three succeeding pairs are also claw-shaped and formed for prehension. Amongst those of the first section, are the opossum shrimps, *Mysis* (so called because they carry their eggs and young in a pouch beneath the thorax and between the thoracic legs), which have the body narrow and elongated like the shrimps, &c., have no gills, or only rudimentary ones, are very small, and are found in vast abundance, especially in the northern seas, where they constitute a large portion of the food of the whale, and are luminous at night. The spectre crabs, *Phyllosoma*, of the tropical seas, which have the body transparent, and so completely flattened (often not thicker than a common wafer), that it is difficult to understand how the viscera have room to play, belong also to this section. In the second section we find the glass shrimps, *Erichthus*, of small size, found only out in the open ocean in hot climates; and the mantis crabs, *Squilla*, which have the gills floating freely, suspended under the abdomen. Their first pair of feet are very large, bent back upon themselves, are prehensile, and resemble very much the fore legs of the insect called *Mantis*. Several species of these are found in Europe, but the greater number are natives of tropical seas. They are considered very voracious. The false abdominal feet are in constant motion, and they swim with great quickness, striking the water with their powerful oar-like tail.

Stomobrachium. —A genus of *Acalephæ*. See MEDUSA.

Strelitzia. —A genus of palm trees. See MUSACEÆ.

Strepsicereæ (στρεφω, to twist; κερας, horn). —A sub-division of the large family *Bovidæ*, or hollow-horned ruminants. The horns of the strepsiceres are generally sub-angular, with a more or less distinct ridge or keel on the front angle. They twist in a contrary direction to those of sheep, the right horn in the strepsiceres twisting in the same direction as the left of the sheep, and *vice versa*. The species are either natives of Africa or Asia. Those of Africa are distinguished by their having all the limbs of

Strepsiceros Kudu—The Koodoo.

nearly equal length, and have large heavy horns. The koodoo, *Strepsiceros Kudu*, is a magnificent animal measuring four feet high at the shoulder, and eight feet in length, with splendid horns nearly four feet long, and beautifully twisted into a wide sweeping spiral of two and a-half turns, surrounded by a prominent wreath which follows all their windings. They live in small fami-

lies of four or five individuals, and inhabit the woody parts of Caffraria along the banks of rivers. The eland or Cape elk is *Oreas Canna*, a still larger animal than the last, being five feet in height, and upwards of eight in length, with shorter horns and a large protuberance on the larynx, and is very much esteemed by the natives and colonists, the flesh being prized more than that of any other animal at the Cape. The bosch-boc, *Tragelaphus sylvatica*, or bush goat, inhabits the woods, which it never quits except during the bright moonlight nights or early in the morning, living singly, and affording a good venison to the hunter. Other African species might be mentioned. In the species, natives of India, the horns are short and conical, and the hind legs are much shorter than the fore. The only species known is the nil-ghau, *Portax Tragocamelus*, a fine large handsome animal, upwards of four feet high at the shoulder. It inhabits the dense forests of India, and is a vicious animal, of very uncertain temper, and bold, powerful, and resolute. It often turns upon its pursuers; dropping on its fore legs and advancing in this position till within a proper distance, it darts suddenly forwards with the velocity of an arrow, and with a force no ordinary animal can withstand.

Strepsiptera (στρέφω, to twist; πτέρον, a wing).—Certain insects were discovered by Kirby living parasitic in the abdomen of some *Andrenæ*, which at that time were nondescript, and could not be referred to any existing order. They were afterwards placed in an order by themselves, which he called *Strepsiptera*. The larvæ live in the bodies of bees, wasps, &c., and the males only undergo a perfect metamorphosis, the females, even when adult, having neither legs, wings, nor eyes, but resemble larvæ, and continue to live parasitic in the bodies of the hymenopterous insects within which they were born. The characters are thus taken from the male, and consist chiefly in the structure of the wings. The anterior pair are quite rudimentary, being transformed into a pair of short, slender, contorted appendages, resembling narrow balancers or *halteres*. The posterior pair are large and membranous. Their nervures are only longitudinal, so that they are able to fold them up like a fan. They have large globular eyes, with the *facettes* few but of comparatively large size. About ten or twelve different species are known, forming a small family, *Stylopidæ*. The genus *Stylops* may be taken as the type, and contains such species as have the tarsi with four joints and the antennæ with six.

Streptospondylus.—A genus of extinct fossil reptiles found in the oolite near Chipping Norton, the lias at Whitby, and the wealden in Sussex and the Isle of Wight. The vertebræ have a ball and socket articulation.

Stridulantia (*stridulare*, to make a sharp noise).—A synonym of the family *Cicadidæ*. A name applied to them from the peculiar stridulous noise the species make.

Strigiceps. *The Hen Harrier.*—See CIRCINÆ.

Strigidæ. *The Owls.*—A family of rapacious birds belonging to the order *Accipitres*, sub-order *A. nocturni*, and containing the birds of that order well known by the name of owls. Like the diurnal birds of this order, the beak is surrounded at the base by a cere, but unlike them it is not naked, but concealed by stiff hairs or delicate feathers. Their head is generally of large size, and this is still further increased by being covered by a mass of downy feathers. Their eyes are large and projecting, and are surrounded with a circle of loose feathers. Their plumage is soft and downy, and generally spotted or barred with different shades of brown or yellow. The tarsi are ordinarily feathered, and the external toe possesses the power of turning either backwards or forwards. Owls are all carnivorous, living upon small quadrupeds, reptiles, birds, and insects, which they hunt during the evening, or even in some cases during the night. Their sense of smell is acute, and it is by means of this sense as much as by sight that they are guided to their prey. When on the wing their flight is silent and low, and they alight on their prey without making the slightest noise. During the day, owls are stupid-looking and inanimate, and are then the objects of attack by the smaller birds in their vicinity. At such times they assume the most grotesque looks and appearance. They make their dwelling-place in old ruins, in cavities of rocks, and in deep forests; their eggs are pure white, and the young when hatched are covered with a fine soft thick down. There are few animals that have been looked upon with such suspicion as owls. In the Scriptures owls are again and again associated with desolation. Poets and painters, both ancient and modern, have delighted to introduce the owl as a bird of ill omen; and even the Red Indians in America look upon it as an unwelcome bird. Amongst the Greeks and Romans, however, the owl was considered as an emblem of wisdom, and was sacred to Minerva; and the horned owl is at the present time held in high esteem by the Tartars. The species of owls are very numerous, and they are very widely distributed. From the arctic circle in the north, to Port Famine in the southern hemisphere, all lands have their owls. They have been arranged in several sub-families, as the hawk-owls, *Surninæ*, in which the facial disc is scarcely apparent, the tail is lengthened, and the head without egrets. They are the least nocturnal of the family, and they hunt their prey often by daylight. The eagle-owls, *Buboninæ*, have the facial disc and ear conch moderate, the tail short, and the head generally with egrets. The howlets, or horned owls, *Syrniinæ*, have the facial disc more prominent, and the ear conch large, and furnished with an operculum. Some of the species have egrets. The true owls, *Strigininæ*, have the facial disc very large, occupying each side of the head;

the wings are long and the tail is short. The eyes in these are set so completely in front, that in order to see anything at their side, or a little behind them, they must turn the head entirely, and thus bring the whole concentrating apparatus to bear upon the object. To this last subfamily, the true, or typical owls, belongs the well known barn owl, *Strix flammea*. This bird is known by several names, the white owl, church owl, screech owl, gili howlet, hissing owl, &c., &c. It is about thirteen inches long, and is of a bright yellowish colour above, varied with gray and brown zig-zag lines, and sprinkled with small whitish dots. The face, throat, and lower parts of body are white, and the feet and toes are covered with a very short down. The barn owl is a native of Great Britain, and at the same time is spread over a great part of the Old World, being found throughout the most of temperate Europe, in India, and Japan, and as far south as the Cape of Good Hope; it occurs also in Australia, but not in America. This bird is said not to hoot, though competent observers declare it does, but it hisses and snores tremendously. It feeds upon rats, mice, shrews, young birds, and beetles, and it has been seen even to catch fish. It frequents churches, old buildings, barns, &c., and forms a rude nest, laying three or four white eggs. Farmers complain that the barn owl destroys pigeons' eggs, and that they are enemies to the dove-cot. It would appear, however, that in reality it is a friend to the farmer from the immense quantity of mice it destroys, and deserves to be encouraged instead of destroyed. Amongst the horned owls, or *Syrniinæ*, the tawny owl or ivy owl, *Syrnium aluco*, is a common species. It is said of him, that he is a sylvan hermit, with a dash of the poacher. This is a truly nocturnal species, hiding itself by day in the dark recesses of deep forests, and never willingly venturing forth till sunset. It is about the size of the barn owl, and is of a tawny-brown colour above, finely dotted with dark brown and black. The tawny owl is the bird which is so well known for the *hooting* noise which it makes in the woods in the evening and at night. There is something very solemn in the sound of this bird's voice, and when slightly disturbed amid its slumbers its inward tremulous hooting, *too-who*, has something almost frightful in it. It is widely distributed throughout Europe, and has been found in Smyrna and Japan. In Great Britain it forms its nest in a hole of a decayed tree or of a rock, or in a deserted nest of the carrion crow or magpie. The long-eared owl, *Otus vulgaris*, belongs also to this subfamily. This bird is elegantly dappled with black and dark brown upon pale brown, and is really a very beautiful bird. It frequents the thickest shade, and more especially loves the old ivied tree, where it remains during the day. It seldom makes a nest of its own, but rests content with a deserted nest of a carrion crow or squirrel. It is widely distributed over the world, inhabiting all Europe, reaching as far east as Astrachan; and from Trebizond to Southern Egypt and Africa. It is found also in America, as far north as 60°, and is called the beaver owl by the Cree Indians.

Bubo Virginianus—Great Horned Owl.

Amongst the eagle-owls, or *Buboninæ*, one of the most remarkable species is the great horned owl, *Bubo Virginianus*. This fine bird is little inferior to the golden eagle in size, and is particularly abundant in the United States of America. It is a native also of the mountainous parts of Central Europe, and has even been seen, though rarely, in Great Britain. It frequents deep forest glens, and makes its nest in the fissures of rocks, in old castles, &c. It is of a ferruginous colour, varied with spots and markings of brown, black, and gray. In America this bird is said to make the woods resound at night with loud halloos, so that travellers have been led astray, mistaking its shouts for the voice of a man, or uttering a sound like the half-suppressed screams of a person suffocating, or being throttled, sufficient to inspire feelings of fear and horror. The little horned owl, or scops-eared owl, *Scops Aldrovandi*, is another species belonging to the *Buboninæ*. It is a mild, pretty little bird, which admits of being tamed. It is a native of Europe, its usual place of abode being on little wooded hills near some village. During the day it keeps itself immovable in the shade of the wood, perched upon the branch of a tree, or roosting in a hole of the wall of some building, till evening comes on, when it sallies forth to seek its prey. It is a summer visitor in England, retiring southwards to the warmer parts of Europe, or to Africa, before the cold weather sets in. It has a plaintive, monotonous cry, *Keu, Keu*, which it keeps repeating with remarkable constancy and regularity the

whole night long. Amongst the hawk-owls, or *Surninæ*, one of the most remarkable species is the great snowy owl, *Nyctea candida*, one of the most beautiful of all the owls, on account of its snowy whiteness and its large size, in this respect nearly equalling that of the great horned owl. It is one of the hardiest of birds; is found in very high northern latitudes, and rears its young among rocky mountains and islands in spite of all the vicissitudes of temperature and season. Its food consists of small animals and fish, and it is remarked as an expert and adroit fisher and hunter by day. It strikes the hare in its course, and snatches its finny prey with a sudden stroke of its powerful foot as it sails over the water. The burrowing owl, *Athene cunicularia*, belongs to this sub-family also. It is a small species, about ten inches in length, and is peculiar to America, over which it is widely spread. It lives in burrows in the ground, either solitary or in small companies. If it can avail itself of the labours of other animals, it will always do so, so that it is a constant interloper in the habitations of the prairie dogs or ground squirrels. It is met with at all hours of the day, and its manners are said by an observer to be very amusing. When disturbed it is described as taking wing at the approach of the intruder, and then alighting again at the distance of a few yards, when it faces him and makes three distinct and formal bows with a mock solemnity that is irresistibly ludicrous. Its note at the breeding season is said to be low, measured, and peculiarly solemn.

Strigocephalus (στριξ, a channel; κεφαλη, head).—A fossil genus of mollusca belonging to the order *Brachiopoda*, and intermediate between the genera *Spirifer* and *Terebratula*. The shell is sub-orbicular, with a prominent beak; foramen large and angular in the young, but becoming small and oval in the adult; hinge plate supporting a shelly loop like that of some of the terebratulæ.

Strigops (στριξ, owl; ωψ, eye). *The Owl-Parrot.*—A genus of birds belonging to the order *Scansores*, and family *Psittacidæ*. As yet only one species, *S. habroptilus*, is known. It is a very curious bird, presenting, in general appearance, the form of a parrot, but possessing also some of the characters of the owl, so as almost to make it be taken for a bird of prey belonging to the family *Strigidæ*. It has an abundant close plumage, tolerably uniform in colour, but with

Strigops habroptilus—The Owl-Parrot; Male, Female, and Young.

green predominating. Black transverse bands appear running across the back, and yellow rays, in a zig-zag form, alternate on the tail, with black marks. Little is known of the habits of the strigops, which is a native of New Zealand. It is nocturnal in its habits, and lives in holes dug out of the ground at the roots of trees, four or five feet deep. It leaves its burrow or hole in the evening, and keeps to the ground in search of its prey. It inhabits chiefly moist, damp woods, and is always found isolated. Its flight, like that of the owls, is very soft. The natives of New

Zealand call it "kakapo," which signifies "night parrot." They are scarce birds, and it is said since the introduction of cats into the island they have nearly disappeared. Its food consists of the roots of ferns and the outer covering of the New Zealand flax, *Phormium tenax*.

Strix. *The Owl.*—See STRIGIDÆ.

Strombidæ.—A family of gasteropodous *Mollusca* belonging to the section *Ctenobranchiata*, or comb-shaped gilled mollusca. The animals belonging to this family are peculiar for having a very compressed foot, which only allows them to move from place to place by putting their foot across the line they wish to take, and then turning themselves over towards the place of their destination, and continually repeating this progress. The shells when young are spindle-shaped or fusiform, and elongate, but when the animal arrives at its full growth, it expands the edge of the mantle in a remarkable degree, which causes the shell of the adult to be very different from that of the young. The edge of the shell then becomes expanded laterally, in some of the species becoming remarkably broad, and in others digitated or divided into several strong finger-like processes. The operculum is narrow, claw-like, and serrated on the outer edge; and the animals use it as a weapon of offence when they have turned themselves on their back. The strombs are carrion feeders, and very active; they inhabit warm seas chiefly, being found on coral reefs at low water, or ranging to ten fathoms. Some of them attain a large size, with bright coloured mouths, weighing sometimes four or five pounds, and the animals are eaten. Pink pearls are said to be occasionally found in them. Great quantities of the West Indian fountain shell, *Strombus gigas*, a shell with a bright coloured mouth and interior, and weighing sometimes as much as four or five pounds, are annually imported to this country and France for the manufacture of cameos, and for porcelain works. In 1850, about 300,000 of these shells were brought to Liverpool for this purpose. This family has been divided into several genera. Those which have the broad lip entire, and in which the canal is short, belong to the genus *Strombus*. Those which have the lip digitated and the canal lengthened into a caudal appendage, belong to the genus *Pteroceras*. Those which have no sinus near the canal, and have the canal lengthened, form the genus *Rostellaria;* and those which have the shell very thin, and rolled around its longitudinal axis, in the form of an elongated cone, almost cylindrical, and pointed at its summit, belong to the genus *Seraphs*. Upwards of seventy-five recent species of shell belonging to this family have been described, and more than double that number have been found fossil.

Strombus. See STROMBIDÆ.

Stromnite, or **Baryto-Strontianite.**—A mineral substance found at Stromness in the Orkney Islands, in an argillaceous schist. It occurs radiated or in small plates, is of a grayish-white colour, has a slightly pearly lustre, and when fractured is glistening and resinous. Specific gravity 3·7; hardness 3·5. It is chiefly composed of carbonate of strontian and barytes.

Strongylus (*στρογγυλος*, cylindrical).—A genus of *Entozoa* or intestinal worms belonging to the order *Nematoidea* or round worms. The species are found parasitic in different mammalia, birds, and reptiles. The most interesting species and the one best known is *S. gigas*, which reaches a length of eight or ten inches, and is found in man, the horse, the dog, fox, &c. Its general residence is in the kidneys, where its presence causes great disorder and irritation.

Strontian.—An earth in the form of a grayish-white porous mass, of an acrid alkaline taste, and composed of oxygen and the metal strontium. It is not found pure in nature, but two of its salts occur as minerals. The sulphate of strontia or celestine is composed of sulphuric acid and strontian, and resembles heavy spar in appearance. It occurs most commonly in the red sandstone formation, and is found at Bristol, in Sicily, and in North America. It is often of pale sky-blue colour, and derives its name celestine from that circumstance. The carbonate of strontia, or strontianite, composed of carbonic acid and strontian, is also found native, but always mixed with carbonate of lime. It was first found at Strontia in Argyllshire, hence its name. These two minerals are used in the arts for making the nitrate of strontia, a salt which is largely used by pyrotechnists to produce a crimson flame in their fireworks. The red fire is formed of nitrate of strontia, well dried, forty parts, flowers of sulphur thirteen parts, chlorate of potash five parts, and tersulphide of antimony one part.

Struthiolaria (*στρυθιον*, an ostrich).—A genus of gasteropodous *Mollusca* belonging to the family *Cerithiidæ* according to some conchologists, or forming the type of a small family, *Struthiolariidæ*, of which it is the type. The species are not numerous, but are peculiar to New Zealand. The shell is turrited, the columella very oblique; outer lip prominent in the middle, reflected and thickened in the adult; inner lip callous and expanded. The operculum is claw-shaped, curved inwards, with a projection from the outer concave edge. The animal walks upon a foot which is broad and short, and its head is prolonged into a cylindrical proboscis longer than the shell itself.

Struthio. *The Ostrich*—See STRUTHIONIDÆ.

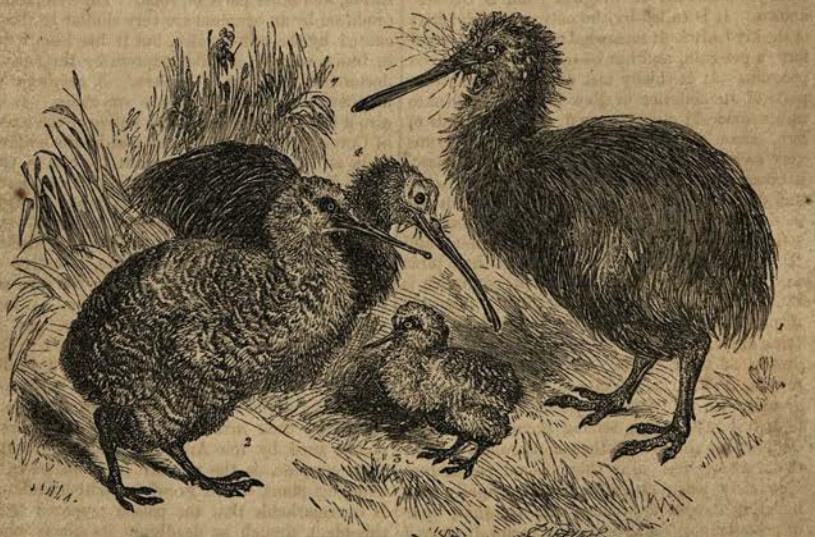
Struthionidæ. *The Ostrich family.*—A family of rasorial terrestrial birds belonging to and forming the principal part of the order *Struthiones*. They are readily distinguished by having a massive body, with generally elongated tarsi, which are terminated by only two or three toes. Their wings are short, almost rudimentary, and quite unfit for flying. They run, however,

with great swiftness, and inhabit dry arid plains. Their food consists of fruits, grains, herbs, young shoots of trees, insects, and snails. The family contains several genera. The genus *Struthio* is characterized by having only two toes, which are stout and strong, directed forwards, and connected at their base by a strong membrane, the internal toe considerably larger than the external, and provided with a thick and hoof-like claw. The wings are furnished with long, soft, undulating plumes, and armed with two spurs, or rather two plumeless shafts, not unlike a porcupine's quill. The bill is moderate, obtuse, straight, depressed at the point; and the legs are very robust. Only one species is known, *Struthio Camelus*, the common ostrich. The ostrich is the largest of all living birds, reaching sometimes to seven or eight feet high, and weighing eighty pounds. It inhabits the vast arid deserts of Africa, extending its range from Egypt and Barbary to the Cape of Good Hope. Its wings being so constructed

Struthio Camelus—The Ostrich.

as to render it incapable of flight, nature has compensated it with incredible swiftness, and it is met with pasturing along with the zebra and quagga in South Africa, and running with equal rapidity. To assist them in their manner of living, the ostriches are provided with fine acute hearing, and very quick sight. They are stupid, inoffensive birds, and their cry is like a howling or lamentation. The females lay from ten to fifteen eggs, depositing them in a slight hollow in the sand. They sit upon them during the night, but leave them to the heat of the sun during the day. Their eggs are very large and heavy, weighing often three pounds. They are very good to eat, and are much sought after by the natives. Entire eggs suspended from the roof is a common ornament of the mosques of the Mussulman, and even Christian churches in the East. The food of the ostrich consists of vegetable substances only, but it swallows indifferently almost everything—stones, iron, lead, copper, glass, wood, leather, &c., &c., nothing seems to come amiss. Ostriches can be trained like beasts of burden, and their strength is so great, that a large bird will carry a couple of negroes on its back. The flesh of the ostrich is said, when young, to be good and palatable, but when full grown they become very fat, and the natives collect the fat and use it in cooking their food, and as a cure for rheumatism. As much as twenty pounds have been taken from one bird. It is chiefly, however, for their feathers that these birds are hunted. The long white feathers of the wing are what are so highly prized as an article of luxury. When properly prepared, great use is made of them in Europe. The feathers of the male are finer than those of the female, are longer and capable of retaining colours better, and those are always reckoned the best that are taken from the bird when alive. The coarsest part of the ostrich plumage is generally denominated *hair*, to which it bears a resemblance, and is used in the manufacture of hats. The best ostrich feathers come to us from the Levant, Barbary, and the west coast of Africa. The trade from Alexandria to Marseilles amounts annually to from 40,000 to 50,000 francs. The ostrich was well known in the most ancient times, is frequently mentioned in Scripture, and the brains of hundreds of these birds used to be served up at the extravagant suppers of the Romans. The genus *Casuarius* has three toes, instead of two as the ostrich has, has the head surmounted with a bony prominence covered with a horny substance, like a helmet, and the front of the neck is naked, and furnished with two wattles. This genus contains the bird well known by the name of cassowary, *Casuarius galeatus*. The cassowary is considerably inferior in size to the ostrich, being only about five feet high, but is robustly built and very strong, and next to the ostrich is the largest of all living birds. The skin of the head and upper part of the neck are naked, of a deep blue and fiery-red tint, with pendant wattles like those of the Turkey-cock. It is a native of the peninsula of Malacca, of Java, and the adjacent islands of the Indian archipelago, and is a mild bird, rather timorous and shy. It feeds upon fruits, eggs of birds, and tender herbage, and eats its food, like the ostrich, with great voracity, swallowing also, like it, bits of iron, stone, glass, &c. The feathers of this bird are peculiar: they generally grow double, having two long shafts growing out of a short one attached to the skin, yet its whole plumage is so poorly supplied with feathers as to resemble, at a little distance, a coat of coarse or hanging hair. Externally, they are all of one colour. Its speed in running is far superior to that of the horse, striking out powerfully with one leg, and projecting its body violently forward

with a bounding motion. The eggs of the cassowary are considerably smaller than those of the ostrich, are of a grayish-ash colour, verging to green, and marked by numerous green little tubercles. The female deposits them in a hollow in the sand, and abandons them to the heat of the climate. The genus *Rhea* has three toes like the *Casuarius*, all furnished with claws. The head is completely feathered, and the phalanges of the wings are furnished with plumes and terminated by a spur. The bill is straight and short, and the nostrils are large and longitudinal. Though the wing is better developed than any of the other genera, it is useless as an organ of flight. There are two species of the genus *Rhea*, both natives of South America. *R. Americana*, the American ostrich, as it is called, is a native of Brazil, abounds on the plains of La Plata, and occurs in Paraguay. It is smaller than the cassowary, and is of a uniform gray colour, except on the back, which has a brown tint. The back and rump are furnished with long feathers, but not of the same rich and costly kind as those of the true ostrich. It possesses great swiftness, and its running is accompanied with a singular motion of its wings, each being alternately raised and outstretched, and then depressed. It lives chiefly upon vegetable matter, such as roots and grass, but appears also to feed upon small fish. The eggs of this bird are found in great numbers scattered over the country, and it is said the male collects them together into a shallow excavation in the sand, and that he alone hatches them, the female taking no part in the process of incubation. The genus *Dromaius* differs from *Casuarius* in having the head feathered instead of helmeted. The bill is straight, with the edges very much depressed, and the nostrils, which are large, are protected by a membrane. The throat is nearly naked, and the foot is three-toed. This genus contains the emu, *Dromaius Novæ Hollandiæ*, a bird which is a native of Australia. The emu or emeu is a large bird, measuring seven feet in length, and nearly equalling the ostrich in size. It has shorter legs, however, a shorter neck, and is thicker in the body. In general appearance it resembles the cassowary, only its head is never surmounted with the bony protuberance which distinguishes that bird Its plumage is for the most part brown and gray mixed,



1. *Apteryx australis*—The Kiwi-kiwi. 2. *A. Owenii*. 3. Young of *A. Owenii*. 4. *A. Mantellii*.

paler on the under parts. It is a shy and timid bird, and is very fleet, affording excellent sport in coursing with dogs. When hard pressed it strikes violently with its legs, so much so, that it is said it can break a man's leg with a single kick of its foot. The male hatches the eggs, while the female watches and guards the nest. The natives of Australia relish the flesh of the emu with greater zest than even that of the kangaroo; and the feast which takes place after killing one of these birds is a very exclusive one, only the seniors of the tribe and authorized persons being allowed to share in it. It is widely diffused over the southern part of Australia and

the neighbouring islands, but is fast disappearing before the encroachment of civilized man. The genus *Apteryx* has lately been raised to the rank of head of a family by itself, though as yet it is the solitary representative. It differs from all the genera of the family *Struthionidæ* mentioned above, in having four toes to its feet. The three anterior ones are unconnected, and the posterior is small, placed on the inner flattened surface of the tarsus, and is directed backwards and almost perpendicularly downwards. The bill is very long and slender, marked on each side with a longitudinal groove, and furnished with a membrane at its base. The wings are merely rudimentary, and it seems to possess no appearance of a tail. The plumage is remarkable: consisting of long, lanceolate, hair-like feathers, which fall loosely like those of the emu. The first specimen of the apteryx was brought to this country in 1812, but little attention was paid to it till 1833, and at that time it had continued to be unique. Some ornithologists placed it along with the dodo, but of late years several additional specimens have been brought to England, and two other species have been added to the list. These birds are natives of New Zealand, and appear to be very rare. The original species, *Apteryx australis*, or wingless emu, is the best known. It is called by the natives the kivi-kivi or the kiwi-kiwi. It somewhat resembles in general form a penguin, and has been called the apterous penguin. It is chiefly met with in the southern parts of the interior of New Zealand, and takes up its abode in places covered with dense beds of fern, among which it conceals itself. It runs very swiftly, but when hard pressed in the chase, it takes refuge in crevices of rocks, hollow trees, and deep holes in the ground, which it excavates in the form of a chamber. In these it also constructs its nest of dried ferns and grasses, and there deposits its eggs. The habits of these birds are exclusively nocturnal, so that not much is known of them. The New Zealanders prize the skin of the kiwi-kiwi very much, and hunt it by torch-light, for the purpose of obtaining it for the dresses of their chiefs. It appears to live upon worms, and larvæ of insects, and it beats the ground with its large and powerful feet in order to disturb the worms, seizing them with its bill the moment they make their appearance. With these strong feet also they defend themselves vigorously when attacked, striking rapidly and inflicting dangerous wounds with the sharp spur or posterior toe. The other species are *A. Owenii* and *A. Mantellii*.

Strychnos.—A genus of dicotyledonous plants belonging to the nat. ord. LOGANIACEÆ. The species belonging to this genus are trees or shrubs, which do not contain a milky juice, and are natives principally of the intertropical parts of Asia and America. Some of them are climbing plants, and most of them are highly poisonous. They act energetically upon the spinal marrow, causing tetanic spasms, or they produce narcotic symptoms by acting on the brain. One of the most important species is *S. nux-vomica*, poison nut or ratsbane. It is a tree which abounds on the Malabar and Coromandel coasts. The fruit is about the size and appearance of an orange, with a coriaceous reddish integument enclosing a mucilaginous pulp. The seeds imbedded in this pulp yield the deadly poison so well known of late years under the name of nux-vomica. The principle contained in these seeds, to which their effects are due, is *Strychnia* or *Strychnine*. When given in poisonous doses strychnine causes death by producing tetanic spasms in the muscles of respiration. It is remarkable, that notwithstanding the deadly fatal effects produced by the seeds on man, many kinds of birds eat greedily of the pulp. The bark is tonic, and is sold under the name of false Angustura bark. The wood, which is often called snake-wood, is very hard and durable, and on that account is applied to many purposes by the natives of the coast of Coromandel. The same principle, strychnia, is contained also in other species of *Strychnos*, though not perhaps in the same degree. *S. Ignatii*, or Ignatius's bean, is one of these. This is a climbing shrub, and grows native in the Philippine Islands, Cochin-China, and other parts of Asia. The symptoms produced by an overdose are very similar to those caused by the nux-vomica, but it has been used in India, where it is called papeeta by the native doctors, in the cure of cholera. *S. colubrina* is another species which contains strychnia. It is also a climbing plant, and is a native of the coast of Coromandel, where it is asserted by the natives to be an effectual remedy against the bite of the cobra di capella. For this purpose it is used both internally and externally. The wood of this species is brought to this country, and is known under the name of *Lignum colubrinum* or snake-wood. *S. Tieute*, the upas tieute, a native of Java, is said, however, to contain the greatest quantity of strychnine of all the species. It is a climbing shrub with glabrous leaves, and is believed to be the true upas tree of Java. The natives prepare from this species the most deadly of the various poisons that are used by barbarous nations for producing death by the wounds occasioned by their arrows. The woorali or ourari poison used by the American Indians for the same purpose, is the produce of *S. toxifera*, a climbing plant, which grows in British Guiana. It is remarkable that the poison prepared from this plant, though so deadly in its effects when applied to a wound, may be taken into the stomach in doses of several grains with impunity. Some of the species of *Strychnos* possess so little of this principle that they are not poisonous, but on the contrary are tonic and bitter. Amongst these is *S. potatorum*, the clearing nut, a shrub which grows to a height of from fifteen to twenty feet, and growing abundantly in the woods and mountains of the East Indies. The berries are

shining and black when ripe, and the seeds are used by the natives, when dried, for the purpose of clearing muddy water—hence its name. *S. pseudo-quina*, the quina do campo, a scrubby plant about twelve feet high with a corky bark, growing in Brazil, is remarkable for its bitterness, nearly equal in that respect to some of the cinchonas. The fruit is eaten by the children of the natives.

Sturionidæ. *The Sturgeon family.* — A family of fishes belonging to the order *Acanthopterygii*. The species are characterized by having their gills free, instead of being fixed as in the rays and sharks, and by these having but one opening, protected by an operculum. The genus *Accipenser* is the type of the family, and contains several species of large size, with their body protected by bony plates implanted in the skin and arranged in longitudinal rows. Their mouth is small, destitute of teeth, and placed at the base of an elongated muzzle. The common sturgeon, *Accipenser Sturio*, is the best known species. This fish is an occasional visitant of the mouths of our rivers, but is most abundant in the northern parts of Europe, and in the American seas. It is generally about six feet in length, but specimens occasionally occur eighteen feet long. It migrates during the early summer months, ascending large rivers to spawn, and descending again to the sea in autumn. Its body is long and slender, gradually tapering towards the tail, and covered throughout the whole length by large bony tubercles. The tail is lobed or slightly forked, the upper lobe extending far beyond the lower. The flesh of the sturgeon is white, delicate, firm, and excellent eating when fresh, resembling veal in flavour. It is generally, however, pickled or salted. The roe of the female, properly salted and dried, furnishes caviare, a substance so much used as an article of food in Russia, Germany, and elsewhere; and isinglass is made from the swimming bladder. The sturgeon was a fish in high repute among the Greeks and Romans, and, according to Pliny, was brought to table with much pomp, and ornamented with flowers, the slaves who carried it being also adorned with garlands, and accompanied by music. The fishery of the sturgeon, in some parts, is of considerable importance; but the most extensive fisheries are those of the Black and Caspian Seas. The species taken there is larger than the common sturgeon, and is called the isinglass sturgeon—*Accipenser Huso*. This fish frequently attains the length of twenty or twenty-five feet, and some have been taken weighing nearly 300 lbs. The importance of this fishery to Russia may be estimated from the fact that several hundred thousands are taken annually. In the year 1829 it was computed that the Caspian fishery gave employment to 8,760 persons, produced 786,482 sturgeons of all kinds; and that these yielded 28,420 pounds of caviare, and 1,092 pounds of isinglass. The best caviare and the finest isinglass is said to be the produce of this species. One species belonging to this family is distinguished by the enormous prolongation of the muzzle, the sides of which are dilated. It has

Polyodon spatula—Spoon-bill Sturgeon.

been formed into a separate genus under the name of *Polyodon*, or *Spatularia*. The mouth of this fish, *Polyodon spatula*, is large and armed with small teeth. It inhabits the Mississippi.

Sturnidæ. *The Starling family.*—A family of birds belonging to the conirostral tribe of the order *Passeres*. The birds belonging to this family are characterized by the bill being generally lengthened, conical, slender, with the tip nearly entire, and the commissure at the base angulated. Their wings are of moderate size, their tarsi strong and scutellated, and the lateral toes equal. The species are so numerous and varied in their appearance and habits that they have been divided into several groups or sub-families. The bower birds, *Ptilonorhynchinæ*, have strong bills, with the culmen elevated, the base wide, and the sides somewhat compressed towards the tip. They are natives of Africa, Asia, and Australia, and feed principally upon fruits and occasionally on insects. See PTILONORHYNCHUS. The grakles, *Eulabetinæ* or *Graculinæ*, have the bill short, compressed on the sides, with the base of the lower mandible swollen; their nostrils are naked. The species are found only in the Indian archipelago, live in troops, and search for insects and fruits, especially the banana. *Eulabes* (*Gracula*) *religiosa*, the Indian grakle, is nearly the size of a magpie, with a round plump body, short tail, and legs of moderate length. The plumage is of a glossy black, shining in different lights with green, blue, and purple lustres; a white spot appears in the middle of the wing, and the legs and feet are of a deep yellow colour. It is lively and docile, and, of all birds, is said to imitate most closely the language of man. *E.* (*G.*) *tristis*, the Paradise grakle, is rather longer than the blackbird, and is of a dark chestnut-brown colour, with a white abdomen, and an oblong white spot on the upper edge of each wing. It is a native of India and the Philippine Islands, is very voracious and particularly fond of locusts and grasshoppers. The Isle of Bourbon was at one time overrun with locusts which had been imported from Madagascar. Several pairs of the Paradise grakle, a bird unknown previously in the island, were introduced for the purpose of destroying these hurtful insects; and notwithstanding the prejudices of the colonists, who at their first introduction actually destroyed them, these birds obtained

a footing on the island and in a short time cleared it of the locusts. The beef-eaters, *Buphagina*, have a large strong bill, with the lower mandible more inflated than the upper, moderate wings, a wedge-shaped tail, and feet armed with strong curved claws. See BUPHAGA. The starlings, *Sturninæ*, have the bill lengthened, conical, with the commissure angulated at the base, wings moderate, the second and third quills longest, and tarsi rather long and scutellated. The species are found in both hemispheres, but especially throughout the eastern continent of Europe; feed on insects, and are of use to cattle by relieving them of their attacks. They fly in large and crowded flocks. The common starling, *Sturnus vulgaris*, is about the size of a blackbird, and has a dark plumage glossed with green, blue, purple, and copper, each feather being marked at the tip with a pale yellow spot. It is an inhabitant of almost every climate, making its nest in hollow trees, the eaves of old houses, towers, and cliffs overhanging the sea. In the autumn they fly in large flocks, and may be known at a great distance by their whirling mode of flight. Their chief food consists of worms, snails, and caterpillars, but they also eat various kinds of grain, seeds, and berries, are said to be particularly fond of cherries, and are accused, though perhaps falsely, of breaking and sucking the eggs of other birds. Their powers of imitation are very considerable, and when in confinement they are very docile, and may easily be taught to whistle tunes and repeat short phrases. The sub-family *Quiscalinæ* have lengthened conic bills, entire and compressed, with the culmen slightly curved; a graduated tail with the sides bent upwards or boat-shaped, and strong feet. They inhabit North and South America and New Guinea. See QUISCALUS. The *Icterinæ* have lengthened conical bills, with the culmen rounded, straight, or slightly bent, and advancing in a semi-circle on the forehead. Their wings are lengthened and pointed, and their feet are strong. They are peculiar to America. See CASSICUS. The *Agelainæ* have the bill rather short, thick at base, and completely conic, with the culmen rather broad and flattened at the base. The species are found in North and South America, generally in flocks among the cattle. They feed on grain, &c., and some of them have the habit of depositing their eggs in other birds' nests. The red-winged starling, *Agelaius phœniceus*, is one of the most noted species of this sub-family. It is about the size of our common starling, and is a native of North America, where it is very destructive to the crops of maize. In winter they are found in the States of Virginia, both Carolinas, Georgia, and Louisiana in immense flocks, particularly near the sea coasts and in the vicinity of large rice and Indian corn fields. They are at times so numerous that they have been described as driving about like an enormous black cloud carried before the wind. During this season they obtain abundance of food from the old rice, corn, and buckwheat fields; and in the month of May they migrate to the northwards. They pair about the middle of April, constructing their nests in marshy meadows or swamps. Their food at this season consists of grubs, caterpillars, and other larvæ, which they devour in immense numbers, thus doing good service to the farmer; but in August and September when the young are nearly full grown, and the young ears of maize or Indian-corn are succulent and milky, they pour in prodigious multitudes upon the low countries, and commit fearful devastation upon the produce of the farmers' fields. They are known in some parts of the United States by the name of maize thieves.

Stylidium (*stylus*, a column). *Stylewort.*—A genus of dicotyledonous plants belonging to the nat. ord. *Stylidiaceæ*. The species are chiefly natives of Australia, and are remarkable for the peculiar irritability possessed by the curved column, which is formed by a union of the filaments and style. This column hangs down on one side of the flower, and when touched at the point of flexure, it springs over with considerable force from one side to the other. If not too far advanced to maturity the column will recover its former position in the course of time. The movement is said to be connected with the bursting of the anthers, and the discharge of pollen on the stigma. The cause is very obscure, but it seems to depend on some changes in the cells.

Stylifer.—A genus of gasteropodous *Mollusca*, which has also been described under the name of *Stylina*. The little shell which forms the type of this genus, *S. astericola*, was found immersed in the rays of a species of asterias, *A. solaris*. In appearance it is globular, hyaline, with a styliform apex and sinistral nucleus. It is a native of Great Britain. Two or three other species have been described, all parasitic upon star-fishes or echini and corals.

Stylops.—A genus of insects belonging to the family STREPSIPTERA.

Styracaceæ. *The Storax family.*—A nat. ord. of dicotyledonous plants, remarkable for possessing in general stimulant, aromatic, and fragrant properties. The species are trees or shrubs, with alternate, simple, exstipulate leaves, and frequently stellate hairs. They have white or yellow flowers, and are natives chiefly of warm climates. The genus *Styrax*, which gives the family its name, is the one which abounds most in resinous and aromatic substances. The species are elegant trees or shrubs, and are natives for the most part of tropical America, though some are also found in Asia and Europe. *S. officinalis*, or common storax, is a native of Syria, Arabia, and southern Europe, particularly Greece and the Peloponnesus, growing to the height of from nine to twelve feet high, with entire leaves covered underneath with white stellate hairs, and white or cream coloured

racemose flowers. A resinous juice exudes from the tree after incisions have been made in it, or from punctures made by insects, which is known by the name of storax. It is aromatic, and was at one time highly esteemed in medicine. At present it is used in the East as a perfume. It is imported into Britain from Trieste, in the form of little cakes. Storax contains resin, a little volatile oil, and from 1 to 2½ per cent. of benzoic acid. *S. Benzoin*, Benjamin storax, or gum Benjamin tree, another resinous species, is a native of Sumatra and Java, and is a tree of seventy or eighty feet high From incisions made in the top of the trunk, there exudes a balsamic resin known in commerce by the name of benzoin or gum Benjamin. When fine, this substance contains about 80 per cent. of resin, and nearly 20 of benzoic acid. Benzoin possesses an agreeable smell which causes it to be much esteemed as a perfume, great quantities being annually consumed in the shape of pastilles and burned as incense in Roman Catholic churches and Mahommedan places of worship. It is also employed medicinally as a stimulant expectorant, and is one of the ingredients in several preparations, as Friar's balsam, Riga balsam, and Jesuits' drops.

Styrax.—See STYRACACEÆ.

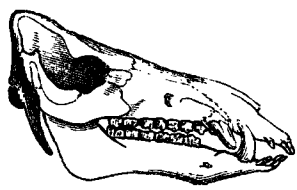
Succinea. *Amber Snail.*—A genus of gasteropodous *Mollusca* belonging to the order *Pulmonifera*, and family *Helicidæ*. The shells belonging to this genus are very thin, and of an amber colour. The spire is small and the aperture large. The animal is large compared with the size of the shell, and inhabits damp places, but rarely enters the water. The species are numerous, nearly seventy having been enumerated, and they are found in almost all parts of the world.

Succinum.—The Latin term for AMBER.

Suchosaurus.—A genus of fossil crocodiles. See CROCODILIDÆ.

Suctoriæ.—A tribe of worms. See ANNELIDA.

Suidæ. *The Hog family* or *Swine.*—A family of pachydermatous animals belonging to the order *Ungulata*; or forming, according to some arrangements, under the name *Suina*, a sub-family of the *Elephantidæ*. The swine are distinguished by their having the nose prolonged and cartilaginous, truncate at the tip where it is strengthened by button-shaped bones, which allow them to use their noses to turn up the ground in search of food. With the exception of the genus *Dicotyles*, they have four toes on each foot, two large principal toes shod with stout hoofs, and two lateral toes which are much shorter and hardly touch the earth. The molar teeth are tubercular, and the canines large, often projected from the mouth and curved upwards. They have a distinct but not long tail, and their skin is covered with strong bristles. The species are not numerous, but they have been arranged in four or five genera. The genus *Sus* is the type, and contains amongst other species the valuable animals well known as the wild boar and domestic sow, *Sus Scrofa*. The wild boar no longer exists in Great Britain, though in



Skull of Boar.

former times it was common enough. It is found in many parts of Europe, however, as well as in India, harbouring in the most solitary places in retired forests. His lair is generally in some wild and remote spot, not far from water, and commanding by some devious path access to the open country. As a beast of chase the wild boar is still held in high repute in some parts of Europe, and in India hog-hunting forms one of the most exciting wild sports that is known. The domestic hog is a valuable animal, and of it, as in the case of most domesticated animals, a considerable number of varieties have been produced. The flesh of the hog, under the name of *pork*, constitutes a material part of the food of mankind, especially in Europe. To a naval and commercial nation like Great Britain it is of great importance, as it takes salt better than any other flesh, and in consequence is capable of being longer preserved. The fat is called *lard*, and is applicable to various purposes, both culinary and pharmaceutical. The skin, when properly dressed, is used for making the seats of saddles, and is also employed by various artificers. The strong glossy hairs of the back are well known as *bristles*, and are extensively used by brushmakers, shoemakers, saddlers, &c., and form a considerable article of import to this country. Russia is the great mart for bristles, those of the Ukraine being held in the highest estimation. At an average of the three years ending with 1842, the entries for home consumption amounted to 1,772,196 lbs. yearly, and in 1849 the total quantity imported amounted to 2,504,676 lbs. The babirussa or Abyssinian hog, *Babirussa Alfurus*, differs from the species of *Sus*, in having the upper canine teeth enormously developed, ascending upwards, and curving back upon themselves, while those of the lower jaw form long and slender tusks as the animal advances in age. The babirussa is an inhabitant of the islands of the Indian archipelago, and is said to be swift and fierce. It has rather slender legs, and the skin is very thickly furnished with hair. Its flesh is said to be much prized. The wart-hog, or Ethiopian hog, *Phacochœrus Œthiopicus*, is a native of Africa. See PHACOCHÆRUS. The

river pig, *Choiropotamus Africanus*, is also a native of Africa, where it lives in marshes, and is called the bosch-vark. The peccaries, *Dicotyles*, belong also to the suidæ, and, like the rest of the family, their flesh is good eating. See DICOTYLES. Fossil remains of several species of the family *Suidæ* have been discovered in the tertiary formations. Three species of the genus *Sus* have been found in the Epplesheim sands, and bones occur frequently in the bone caverns and in the bone breccia.

Suina.—See SUIDÆ.

Sula. *The Gannet.*—A genus of birds belonging to the order *Anseres*, and family *Pelecanidæ*. The birds belonging to this genus have a long and strong bill, forming an elongated cone very large at the base, and compressed towards the point, which is slightly curved. The edges of the mandibles are serrated, and the nostrils are basal, linear, and hidden. They have short, but strong legs, placed rather backwards, and four toes all united by membrane, the middle one pectinated. The wings are long and the tail cuneiform. The typical species is the solan goose or gannet, *Sula Bassana*, a bird about the size of a tame goose, measuring two feet nine inches in length, and weighing nearly seven pounds. The plumage is nearly white, but the feet and legs are black. The solan goose is very abundant in the Hebrides, in many parts of Scotland, in Norway, and in Newfoundland. The nest, composed of turf and sea-weed, is placed in the caverns and fissures of rocks, on their ledges, and even on the bare ground. Their chief haunts in Scotland are in the Hebrides, and such rocky islets as Ailsa Craig in the Firth of Clyde, and the Bass Rock in the Firth of Forth, from which latter habitat it derives its specific name. The method in which this bird takes its prey is peculiar. As it flies about with a heavy and irregular flight, it keeps a look out for its prey, and as soon as it has discovered a fish, it rises to such a height as experience shows best calculated to carry it by a downward motion to the required depth, and then partially closing its wings, it falls perpendicularly on the prey, and rarely without success, the time between the plunge and emersion being about fifteen seconds.

Sulphur.—An elementary substance found native, as well as in combination with various metals, forming sulphurets and sulphates. Native sulphur is found chiefly in the regions of extinct or active volcanoes, and that of commerce is mostly procured from Sicily. It occurs in beds along the central part of the south coast, and to some distance inland. Sixteen or seventeen thousand tons are annually imported from Sicily into England alone.

Surirella.—A genus of minute plants belonging to the order *Algæ*, and family DIATOMACEÆ.

Surnia.—A genus of owls. See STRIGIDÆ.

Swartzia (after *Swartz*, the Swedish botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. It is composed of trees with simple or unequally pinnated leaves, and flowers in racemes growing from the axils of the leaves. They are natives of South America and the West Indies. One of the best known species is the tomentose swartzia *S. tomentosa*, a high thick tree, with strong angular branches, growing on the borders of rivers in Guiana. The wood of this tree is of a fine red colour, which becomes black by age. It is considered very indestructible, and is used for making rudders for ships.

Swietenia (after *Van Swieten*).—The genus of plants which contains the mahogany tree. See CEDRELACEÆ.

Sycephalæi (*συν*, with; *κεφαλη*, head).—A family of double monsters belonging to the order *Autositarii*, characterized by there being two distinct bodies below the umbilicus, intimately united above, and surmounted by a head more or less manifestly double. There are three varieties of this monstrosity. I. *Janiceps* (*Janus*, and *caput*, the head), in which all the elements of two heads are presented, but fused as it were into a single one with two faces opposite each other. II. *Iniops* (*ινιον*, occiput; *ωψ*, eye), in which opposite the perfect face, there is an imperfect one, represented by one orbit and one eye in the centre, and two ears placed close together, or sometimes by a single median one. The appearance of an individual of this variety is as if there were a head with an eye and ears in the occiput. III. *Synotus* (*συν*, with; *ους*, *ωτος*, ear), in which the second face is represented merely by two ears placed close together, or by one single median one. Of the two first kinds the cases are very rare either in man or in the lower animals; but this last kind is not uncommon in man, and is very common in the lower animals. The individuals always die, however, either at the moment of birth, or very quickly after.

Syene.—A crystallized rock, composed of quartz, felspar, and hornblende, differing from granite in the mica of that rock being replaced by hornblende. It was first obtained in Egypt and was anciently much quarried at Syene in that country—hence its name.

Sylvia.—See SYLVINÆ.

Sylvicola (*sylva*, a wood; *colo*, to inhabit) —A genus of birds belonging to the dentirostra tribe of the order *Passeres*, family *Luscinidæ* and sub-family *Mniotiltinæ*, or *Sylvicolinæ*. They have a straight beak, slender and very sharp pointed, and the upper mandible is notched towards the point. They are lively, bold birds, and live in flocks, suspending themselves from branches of trees, and when in search of food leaping from branch to branch and from tree to tree. Their food consists of insects and soft fruits, as bananas, figs, &c. They are migratory birds, passing from one part of the country to another, according to the seasons, but are generally found in cultivated

places. The species are nearly all American. *Sylvicola*, or as it is now named, *Dendroica coronata*, represents the genus. This bird is called the myrtle bird, or yellow-crowned warbler, and is a native of the United States of America. Its plumage is black and yellow spotted with white, and it is five or six inches long. It is a migratory bird, breeding in the northern States, and passing the winter in the southern States, during which period their food consists almost exclusively of the berries of the myrtle-wax tree (*Myrica cerifera*), or those of the Virginian juniper. Its note is a sweet and varied, rather plaintive warble, resembling the farewell, solitary, autumnal song of our common redbreast.

Sylviæ. *The Warblers.*—A sub-family of birds belonging to the dentirostral tribe of the order *Passeres*, and family *Luscinidæ*. The species belonging to this group are very small birds, and of a weak structure. The bill is slender, straight, and the tip slightly notched. Their wings are rather lengthened, and the tail is moderate, square, or slightly emarginate. They afford examples of almost every degree of song, from the oft repeated double note from which the *Chiff-Chaff* takes its common English name, to the rich and varied melody of the *Black Cap*. They were all contained in the genus *Sylvia*, which may be considered the type of the family, though we now look in vain for the name in the most recent arrangements. The grasshopper warbler, *Sylvia locustella* (*Locustella Rayii*), is a summer visitor to this country, arriving about the middle of April, and leaving us in September. It obtains its English name from its note being like that of the grasshopper—a sort of whisper which the by-stander seems to hear close beside him, though perhaps a hundred yards distant, and which, when close at his ear, is scarce any louder than when the bird was a great way off. It is an artful little creature, and its plumage is well calculated to assist it in concealing itself. In the height of summer it may be heard chirping at night. The sedge warbler, *Sylvia* (*Calamodus*) *phragmitis*, is a summer visitor also, arriving in April, and leaving in September. It is of a slender, elegant figure, and frequents reedy and marshy places. During the season of love and incubation, this little bird sings incessantly night and day, and so varied are its notes, that it has been called "the delicate polyglott." With clear but hurrying execution he imitates now a sparrow, then a swallow, and anon a skylark. The reed warbler, *Sylvia* (*Calamodyta*) *arundinacea*, is a merry songster of the same kind as the last, though his note is of better quality. He sings by night as well as by day, and imitates the notes of several different kinds of birds. The garden warbler, *Sylvia* (*Curruca*) *hortensis*, visits us in April and remains till September, and unlike his congeners, who are almost all insectivorous, he feeds upon fruit, peas, &c. His song is rich and mellow, and though he generally sings like other warblers concealed from view, he not unfrequently may be heard pouring forth his wild flute-like notes from the top branches of a tree. The garden warbler is the true *Becafico*, so earnestly sought after on the continent for the tables of the dainty. The willow warbler, *Sylvia* (*Asilus*) *trochilus*, which arrives about the middle of April, is a particular favourite with out door naturalists. His notes possess a simplicity and sweet cadence which is remarkably pleasing, and though they are but few, the tone is so silvery that it seems to tell of all the sweet influences of spring, the April shower and sunshine, the bursting bud, and the opening flower. The willow wren is one of the most abundant of our warblers, and is a very useful bird, destroying great numbers of aphides and other insects. The nest is built on the ground, and like that of the wren is arched over, and is entered from the side. The chiff-chaff, *Sylvia* (*Phyllopneuste*) *hippolais*, is the smallest of our British visitors. It is a welcome little bird, one of the earliest heralds of spring. It arrives in March, and lingers with us till the middle of October. Its note is not particularly pleasing, but the bird itself, in its wild state, is of great use to gardens, clearing rose trees and honeysuckles, &c., of aphides and other insects. The red-start, *Ruticilla phœnicura*, is a beautiful little member of this vocal family. It is rather more than five inches in length. The male has the bill, cheeks, and throat, the feet, and legs, black; the breast, rump, and sides, red; the forehead white; the crown of the head, hind part of neck and back, of a deep blue gray. It is found over all Europe, but is only a summer visitor with us, arriving in the second week of April, and leaving early in September. The red-start is a sweet and indefatigable songster, well known to every schoolboy, haunting the skirts of woods, lane and meadow hedgerows, orchards, gardens, and above all the old ivy covered ruins. The male is an affectionate bird, constantly singing to his mate, being often heard as late as ten o'clock at night, and as early as three o'clock in the morning. In captivity this bird becomes very tame, and if bred up from the young state, will learn the note or call of almost any other bird, and will learn to whistle a tune. The black-cap, *Curruca atricapilla*, is acknowledged to excel all the other warblers in power, beauty and execution of notes, and many people prefer it even to the nightingale. "If it has less volume, strength, and expression, it is more pure, airy, and flute-like in its tones, and its song is more varied, smooth, and delicate. It sings also for a much longer period, both when wild and in confinement, its song being hardly suspended throughout the year by day, and prolonged like that of the nightingale far into the night, though begun at dawn." Notwithstanding this it is doomed, under the general name of a "becafico,"

to minister to the luxuries of the rich man's table. The number of species belonging to the family of warblers is very considerable, and they appear to be spread over all the habitable regions of the globe. They perform an important part in the economy of nature, for to them is apparently entrusted the subjugation of those innumerable minute insects which lurk within the buds, foliage, or flowers of plants, and whose presence there might produce an infinite amount of mischief.

Sylviidæ.—A family of birds containing the *Warblers;* considered by some authors only a subfamily of *Luscinidæ*. See SYLVINÆ.

Symphoricarpus.—A genus of plants. See CAPRIFOLIACEÆ.

Synadelphus.—A genus of monsters. See MONOCEPHALII.

Synallaxis.—A genus of birds belonging to the tennirostral tribe of the order *Passeres*, and family *Certhiidæ*. There are several species, amongst which, *S. garrulus*, a native of America, is about the most remarkable. This bird is of a brown colour, and builds a very singular nest, which is so large as to form a feature in the woodland scenery of Bahia. It is built in low trees, formed externally of dry sticks, usually three or four feet long, and resembling at a distance a thick twist of beanstalks, thrown in the branches by accident. Sometimes two of these nests appear as if joined together, and there is an opening on the side, besides one on the top. Both male and female are generally seen near the nest, uttering a shrill, incessant, monotonous chirp, particularly in the morning and evening.

Synanceia.—A genus of acanthopterygious fishes belonging to the family *Sclerogenidæ* or *Triglidæ*, and containing about a dozen species, possessing in general a very repulsive appearance. Their skin is scaleless, smooth, and slippery. The mouth is vertical, resembling that described in *Uranoscopus*, and the eyes are high in the head, and in many lateral. *S. brachio* is a native of the Isle of France, and is held in great abhorrence by the negroes, who call it "fi-fi," or *hideous*. It has almost a frightful look, and at first sight no one would consider it a fish, but rather a mass or unformed lump of corrupted jelly. Its head and members seem enveloped in a sack of thick, soft, spongy skin, warty and wrinkled like that of a leper, and irregularly blotted over with various tints of brown and gray. Sometimes it appears entirely black; but it is always gluey and disgusting to the touch. The eyes are small and scarcely discernible in the large cavernous head. It possesses great tenacity of life, living for a length of time out of the water. The inhabitants of the Isle of France regard this fish as a reptile, and dread the wounds inflicted by its spines more than the stings of snakes and scorpions.

Synguathidæ. *The Pipe-fish family.*—A family of acanthopterygious fishes, remarkable for several peculiarities in their structure and organization. As a family they differ from most other fish in having their branchiæ or gills divided into little tufts, placed by pairs on the bony branchial arches, instead of being formed of regular pectinated plates. Their body is also covered with shield-like indurated plates, which give it an angular appearance. The genus *Syngnathus*, or true pipe-fish, is the type, and is still further remarkable from several of the species having a sort of pouch under the base of the tail for receiving the eggs, which are hatched there, and escape by an opening made at the proper time. *Syngnathus acus*, the great pipe-fish, is one of the most common species, and is found on many parts of our coasts; but by far the most extraordinary species is the foliated pipe-fish, *S. foliatus*, a native of the Indian seas. The back, tail, and abdomen of this curious little fish are furnished with several leaf-shaped appendages, placed on very strong, rough, square spines or processes, which, were it not for the regularity of their respective proportions, might be mistaken for the leaves of some kind of sea-weed adhering to the spines. Most of these species are straight, but others of the family contract after death so as to form a grotesque resemblance to a horse in miniature. These form the genus *Hippocampus*, and from their shape are generally called sea horses. *Hippocampus brevirostris*, the short-nosed sea horse, is occasionally met with on the British coasts. It is from six to ten inches long, the body much compressed, short, and deep; the whole length of the body and tail divided by longitudinal and transverse ridges, with tubercular points at the angles of intersection. The snout is slender, and the tail long, quadrangular, and terminated in a naked or finless tip. When swimming about, the hippocampus maintains a vertical position, but the tail is ready to grasp whatever meets it in the water. It quickly entwines in any direction round weeds or other objects, and when fixed the animal intently watches surrounding objects, and darts at its prey with great dexterity. In some species of the family the pectoral fins are very large and expanded, giving them a peculiar appearance, and obtaining for them the generic name of *Pegasus* or flying horse. The body resembles that of hippocampus, but the thorax is broad, depressed, with the gill openings in the sides, and the mouth placed under the prominent muzzle. The typical species, *Pegasus draco*, is a small fish, three or four inches long and of a whitish colour. The pectoral fins are so large as to make it probable that they are used in the same manner as the fins of the flying fish, to support the animal in the air for a few seconds while it springs over the surface of the water.

Syngnathus. *The Pipe-fish.*—See SYNGNATHIDÆ.

Syringa (συριγξ, a pipe). *The Lilac.*—A genus of dicotyledonous plants belonging to the nat. ord. *Oleaceæ*. This genus is composed of small trees or shrubs, natives of Central and Western Asia, and in some parts of Europe.

Their opposite, heart-shaped, petioled, and very entire smooth leaves, and their sweet-scented flowers disposed in beautiful thyrsoid terminal panicles, make them great favourites. Two species especially are very much cultivated and greatly esteemed. The common lilac, *S. vulgaris*, has long been introduced into most parts of Europe, where it grows freely, and has in many places become almost naturalized. Originally a native of the Levant and Transylvania, it has spread rapidly over all the gardens of Europe, and bears this climate well. The first plant appears to have been transported from Constantinople to Vienna in the end of the sixteenth century. In good situations it rises to the height of eighteen or twenty feet. Its growth is rapid, but it is not durable, few living more than thirty or forty years. The flowers are generally of a beautiful violet colour peculiar to themselves, and deriving its name from that of the plant. White varieties are not uncommon. The Persian lilac, *S. Persica*, is the other species, which is much cultivated. It was originally a native of Persia, from whence it was introduced into Europe. It is not such a lofty shrub as the preceding, and its leaves are smaller and lanceolate. The flowers of both these species exhale a remarkably sweet scent. The stems were at one time much used in Turkey, in the manufacture of Turkish pipes—hence its generic name.

Syrphidæ.—A family of insects belonging to the order *Diptera*, containing numerous genera and species. They are generally of a moderate or large size, and of variegated colours. They have a long membranous proboscis, a hemispherical head covered for the most part by the eyes, and the abdomen most frequently depressed and elongated. They are fond of flowers, and fly with amazing swiftness. The larvæ of the genus *Syrphus*, which is the type of the family, are in the form of an elongated cone, uneven and sometimes spinose. They fix themselves by means of a kind of glue, and feed upon *Aphides*, which they often hold up in the air and suck very quickly. The larvæ of the genus *Volucella* inhabit the nests of the humble-bees (*Bombus*), feeding upon the larvæ of these insects. Some of them resemble so much the humble-bees, wasps, &c., that they are frequently mistaken for them by the inexperienced.

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Tabanidæ. *The Breeze-flies.*—A family of insects belonging to the order *Diptera*. The flies belonging to this family are generally larger than the others belonging to the order; they have a large body with a depressed head, and their proboscis is exserted, enclosing lancets and ending in two fleshy lobes; their wings are extended horizontally, are moved by powerful muscles, and provided with a greater number of nervures than any others of the order. They live chiefly by sucking the blood of man and other animals, but the males are by no means so sanguinary in their habits as the females. These latter pierce the skin of their victims with great facility by means of the lancets of their proboscis, while the former live partially upon the juices of flowers. The breeze-flies are met with chiefly in woods and pasture fields in the middle of summer and during the heat of the day. When flying, their motion is accompanied with a loud buzzing noise. The genus *Tabanus* is the type of the family, and the species are pretty numerous. *T. bovinus* is the largest of all the British species, and is extremely troublesome to cattle, sucking their blood in such a manner as to cause considerable pain. The perfect insect is a large, pale brown fly, marked on the back by a series of considerable sized, whitish, triangular spots, and the larva is a large, dusky yellowish, cylindrical worm, marked by transverse blackish rings. The egg is deposited by the female in the ground, and the larva continues to reside under ground, changing at the proper time to a cylindric, brownish chrysalis.

Tabaschir or **Tabasheer.**—The plants belonging to the nat. ord. *Gramineæ* or grasses, contain in their composition a considerable quantity of silex. It is the existence of this mineral substance in the grasses which gives that external hardness that characterizes so many of them. The bamboo, one of the most gigantic species of the order, contains a large quantity of this substance at the knots on the stem. This substance, which is nearly pure silex, is called tabasheer or tabaschir, and was at one time considered by the natives of the East to possess extraordinary virtues, and indeed was looked upon with a degree of veneration.

Tabernæmontana (called after *Tabernæmontanus*, a botanist).—A genus of dicotyledonous plants. See APOCYNACEÆ.

Tacca (Malay name for one of the species).—A genus of monocotyledonous plants belonging to and forming the type of the nat. ord. *Taccaceæ*. The species belonging to this genus are herbs with long petioled, palmate or pinnatifid leaves, and tuberous roots. They are natives of the tropical parts of Asia and the South Sea Islands. One of the most remarkable amongst them is *T. pinnatifida*, a plant which is very much cultivated in the Malayan peninsula, the islands of the Indian Ocean and the Pacific. The tubers of this plant when growing wild are extremely bitter and acrid, but by cultivation they become less so, and an excellent starch is extracted from them, by steeping them in water for four or five days and then rasping them. The raspings are again washed in cold

water on a sieve. The sediment deposited is then taken up, washed anew and dried. This starch is very white and nutritious, and is cooked in various ways by the natives, who use it as an important article of food. According to some authorities it is preferable to arrow-root, and that prepared at Tahiti is exported under that name to London.

Tachina (ταχυς, agile).—A genus of insects belonging to the order *Diptera*, family *Muscidæ*. The flies of this genus live upon flowers, but the females deposit their eggs upon the larvæ of other insects, chiefly caterpillars. When hatched these larvæ eat into the substance of the poor caterpillars, and feed upon the fatty substance which abounds in them. At the completion of their growth they make their escape.

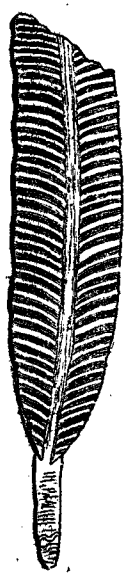
Tachinus (ταχυς, agile).—A genus of pentamerous coleopterous insects belonging to the family *Staphylinidæ*. This genus contains upwards of forty species of beetles, which are found in America and Europe chiefly, a few only being found in Asia and Africa.

Tachypetes.—A genus of birds belonging to the order *Anseres*, and family *Pelecanidæ*. The genus is also known by the names of *Atagen* and *Fregata*, and contains one species which is universally known as the frigate or man-of-war bird. This raptorial bird, *T. Aquila*, from its immense extent of wing and its dashing habits, has been called the swiftest sailing ship of war that sweeps the seas. Its eye is that of an eagle, its claws those of a vulture, and its gliding motion that of the kite. The body is light, the spread of its wing immense in proportion, its tail long, slender, and forked, so that it not only possesses great rapidity of flight, but a long continuance of it, and a power of maintaining itself for a length of time on outspread pinions in the air. The frigate bird is very voracious, and is met with far out at sea between the tropics, where it appears to prey upon the flying fishes, and attacks fiercely the gulls, &c., in order to make them disgorge their prey. Their nest is built on rocks, high cliffs, or lofty trees, in desert uninhabited islands, and the eggs are of a carnation colour dotted with crimson.

Tadorna. *The Shield-drake* or *Sheldrake.* See ANATINÆ.

Tænia. *The Tape-worm.* A genus of animals belonging to the class *Entozoa* or intestinal worms, order *Cestoidea*, and family *Tæniidæ*. The tape-worm consists of a flat, compressed and numerously jointed body, and a head furnished with four suctorial depressions, and in many of the species a median, imperforate, retractile proboscis, very frequently armed with one or two circles of minute recurved hooks, especially in the young state. The alimentary canal is continued uninterrupted throughout the whole length of the body, but the reproductive organs are repeated in each joint. They are situated at the margin of the joi[illegible]; in some species on each joint on the same side; in others on alternate joints on alternate sides. The species are numerous, but exist only in vertebrated animals. *T. solium* is the common tape-worm of the human species, and its presence in the intestines frequently gives rise to much suffering. It is sometimes of great length, specimens having been found measuring five yards or more. As in this species each joint possesses reproductive organs and can propagate its species, it is very difficult to get rid of them, if the head remain unexpelled. The genera of what have been called the cystic worms, *Cysticercus*, *Echinococcus*, and *Cœnurus*, are now understood to be merely the larva state or young undeveloped form of the genus *Tænia*.

Tæniopteris.—A genus of fossil ferns, very remarkable for the form and neuration of their fronds. The greater number of the species have the fronds simple. The fructification has rarely been observed, but the sori appear to be arranged in rounded groups, as in polypodium and aspidium. They are chiefly found in the oolitic and liasic strata. One species, however, is peculiar to the coal measures.



Tæniopteris vittata.

Tæniidæ. *Ribbon-fish.*—A family of acanthopterygious fishes nearly allied to the *Scomberidæ*. The bones of these fishes are of a loose texture, in most of them being little more solid than a fibrous network. They are compressed, elongated, and ribbon-shaped, with a naked silvery skin. Some of the species have smaller mouths than others, and are the most typical of

all belonging to the family, and best deserving the name of ribbon-fish, as some are nine or ten feet long, and yet not six inches high, and scarcely one inch thick. We know very little of the habits of these fishes, as they are constructed for inhabiting the still waters of great depths, and are seldom seen except when thrown ashore in tempests. They are of such delicate texture, that even then they are seldom found perfect, but generally in a more or less mutilated condition. Two or three species are occasionally thrown up on the British coasts, such as *Trachypterus bogmarus*, the vaagmaer or deal-fish, *Gymnetrus Hawkinsii*, and *Cepola rubescens*, the red-band fish or red-snake fish.

Talc.—A mineral substance composed chiefly of silex and magnesia, and approaching in external characters very near to mica. It occurs in thin and flexible laminæ, soft and non-elastic. It is soft enough to be easily scratched with a knife, and its powder is unctuous to the touch. It is found in beds, never in large masses. A variety called lamellar or Venetian talc is found in the Tyrol, and carried to Venice, where it is reduced to a very fine powder, and made into coloured crayons called pastels. It is also used by the Venetians as the base of certain cosmetics, as the "rouge vègètal," &c. Another variety called talc slate is known by the name of Briançon chalk. It is found near Fenestrelles and at Prasles in Piedmont. Tailors employ this kind of talc instead of chalk to trace the patterns they wish to cut. It is also used for cleaning silks, for assisting the foot in slipping into new boots, and for diminishing friction in machinery. Talc occurs in considerable abundance in India and China, and the fine thin leaves into which it can be separated, are used in windows instead of glass. In Bengal a seer of talc costs about two rupees, and will sometimes yield a dozen panes twelve inches by nine, or ten by ten, according to the form of the mass, transparent enough to allow ordinary objects to be seen at twenty or thirty yards' distance. It is also found in various parts of Scotland, and in several places on the continent.

Talegallus or **Talegalla.**—A genus of birds belonging to the order *Gallinæ*, and family *Megapodidæ*. The beak of the birds belonging to this genus is shorter than the head, very robust, compressed above; and the upper mandible is convex. The cheeks are naked, and the head and neck are furnished with simply barbed feathers. The wings are rounded, concave, and of moderate size, and the tail is rather long and rounded. The tarsi are strong and scutellate, terminated by four lengthened toes, the large toe resting entirely upon the ground, and furnished with a strong claw. The talegallæ have a general resemblance to the genus *Porphyrio*, from the French name for which, *Talève*, is derived the name *Talegallus*. The typical species is *T. Cuvierii*, a native of New Guinea, about the size of a common small hen, and of a deep brown or black colour. It was found in the brush, not far from the sea, and its habits are those of gallinaceous birds. It is a very rare bird; but there is another species, *T. Lathami*, the brush turkey of the colonists, found in Australia in greater abundance, about the size of a turkey, and apparently taking the place of that bird in New Holland. It was first described under the name of the New Holland vulture. Its general colour is blackish-brown, the skin of the head and neck deep pink-red, and the wattle, which exists also in the female, is of a bright yellow, tinged with red where it joins the neck. The brush turkey is a gregarious bird, moving about in small companies like other gallinaceæ, and is very shy and distrustful. It is particularly remarkable, however, for the manner in which the females form their nest and lay their eggs. They collect together a large quantity (from two to four cartloads) of decayed vegetable matter, which they heap up in the form of a conical dome five or six feet high, or even more. They then make holes in this mass, nearly an arm's depth, into which they deposit their eggs perfectly upright, with the large end upwards. These are placed at the distance of nine or twelve inches from each other, and it is said by the natives that it is no unusual thing to obtain nearly a bushel of eggs at one time from a single heap. These eggs are declared to be delicious eating, and are in consequence much sought after. They are hatched by the heat generated by the fermentation of this decomposing mass of vegetable matter.

Talitrus.—A genus of crustaceans belonging to the section *Edriopthalmi*, order *Amphipoda*, and family *Gammaridæ*. The species belonging to this genus are small creatures which inhabit the sandy shores of our seas. They are generally found living under the debris of marine plants collected at high water, and they leap with such agility that they are often called "sea-fleas." They live united in great numbers, are carnivorous, and devour with great rapidity the bodies of such animals as happen to be thrown up on the beach. When disturbed in their retreat under the decaying fuci, they bury themselves in the sand. *T. saltator*, which may be taken as the type, is very common on our coasts.

Talpa. *The Mole.*—A genus of insectivorous animals belonging to the family *Talpidæ*, and composed of the little creatures called moles. Living a subterranean kind of life, the organization of the mole is admirably adapted for that purpose. The head is long, pointed, and terminated by a slender cartilaginous snout, which is furnished at its extremity with a peculiar small bone. This enables the animal to bore into the ground as with an auger, and at the same time it acts as a delicate organ of touch. The muscles of the neck are very powerful, and a peculiar bone is formed in the cervical ligament. The anterior limbs are short, placed near the head, and very

powerful. The hand is strongly developed, and the palm is directed outwards; the toes are very short, but armed with long, very strong, flat, and trenchant claws. The bones of the chest and front legs are all formed for the attachment of powerful muscles; and in such a manner is the whole creature formed, that it makes its way under the earth with greater rapidity than upon the surface. The hinder extremities are weak, and the jaws and teeth are formed for living upon worms and insects. The eye is extremely small, and so well concealed by the hair of the skin, that the animal appears at first sight to be destitute of these organs altogether. The common mole, *T. Europæa*, is about five or six inches long, of a nearly black colour, and its fur is close set and soft as the finest velvet. Earth worms form the chief part of its food, but it feeds likewise upon the larvæ of insects, and snails, frogs, mice, &c. Its nest is formed under ground, and the subterranean galleries which it constructs are very remarkable. They are numerous, very long, and have several exits around the principal part where it resides, and which is called its fortress. These are recognized by the little mounds of earth known as mole-hills, which it throws up here and there at short distances from each other. Many agriculturists suppose that moles are very injurious to their fields, but naturalists maintain that it is of more use in destroying worms and insects, which, if allowed to become too numerous, would be a great deal more destructive to the crops than it is hurtful by undermining the ground. Another species has been described, a native of the Apennines. It was believed to be perfectly blind, and in consequence received the name of *T. cæca*. It is a little smaller than the common mole, and the eyes are excessively small. Several fossil species have been found in the tertiary formations.

Tamaricaceæ. *The Tamarisk family.*—A nat. ord. of dicotyledonous plants, consisting of shrubs or herbs, with alternate scale-like leaves, and racemose or spiked flowers. They are confined chiefly to the eastern half of the northern hemisphere; the greater number of the species being found in the Mediterranean region. They are innocuous plants, but possess a bitter astringent bark, and some of them are remarkable for the quantity of sulphate of soda found in their ashes after burning. There are three genera, and about forty-three species known. The genus *Tamarix* is the type, and gives its name to the order. See TAMARIX.

Tamarindus (from the Arabic word *Tamar-hendy*). *The Tamarind Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. There are only two species known, both of which are trees with abruptly pinnate leaves, bearing many pairs of small leaflets and racemes of flowers. *T. Indica*, the East Indian tamarind, was the earliest known species, for a knowledge of which in Europe we are indebted to the Arabians, and is a native of India and Africa. It is a handsome tree, with spreading branches, the trunk of good size, covered with a brown bark, and the flowers yellow, streaked with red veins, and possessing a very pleasant perfume. The pods are long, being six times longer than they are broad, and the fruit forms an object of commerce with various parts of Europe. The kernels are very hard, but covered with a soft pulp, which is the part used. Before they are ripe they are extremely acid, and the Egyptians use them for acidulating their meats. When ripe they are made into a confection with sugar, which is much used for making a pleasant, cooling, acidulous drink. The West Indian tamarind is now made a distinct species under the name of *T. occidentalis*. The legumes are much shorter than those of *T. Indicus*, being only about three times longer than they are broad, and the fruit of it is preferred to the other. The fruit, freed from the shelly fragments, is placed in layers in a cask, and boiling syrup poured over it till the cask be filled. In Europe this confection is much used in medicine to make cooling drinks in fevers, &c. Tamarinds contain a quantity of sugar, mixed with tartaric, malic, and citric acids.

Tamarix. *The Tamarisk.*—A genus of dicotyledonous plants belonging to the nat. ord. *Tamaricaceæ*. It is the type of the family, and is composed of shrubs or trees growing in the countries bordering on the Mediterranean, in the Canaries, India, &c. The leaves are small, entire, alternate, and resemble scales, and the flowers are small and disposed in paniculated spikes of a red colour. *T. gallica*, the French tamarisk, is a very common species along the shores of the Mediterranean, and is found also in England and the Channel Isles. In some parts on the French coast, the plant is used for firewood, and in many places it is very much cultivated along the sides of ornamental waters in gardens and parks. Its slender branches, covered with small, glaucous-green leaves, give it a peculiar air of lightness and elegance. The bark has been employed as a diaphoretic, diuretic, and aperient. A variety of this species grows on Mount Sinai, *T. gallica, var. mannifera*, called tarfa by the Arabs, which is subject to the attack of an insect, a species of *Coccus* (*C. manniparus*). It exudes in consequence a kind of manna, which is called "manna of Mount Sinai." *T. Indica*, the Indian tamarisk, a native of India, and one or two other Indian species, are subject to the attacks of a species of *Cynips*, which produce galls that possess astringent properties, sufficient to render them valuable in dyeing. The Eastern tamarisk, *T. orientalis*, a small tree growing to the height of from ten to twenty feet, is perhaps the largest and most elegant of all the species. It is a native of Arabia, Persia, and the East Indies, and one of the finest specimens existing is to be seen at Babylon.

Tamatias. *The Puff Birds.*—A genus of

birds belonging to the diurnal fissirostral tribe of the order *Passeres*, and family *Alcedinidæ*. This genus is generally placed in systems of ornithology in the order *Scansores*, but as shown by Mr. G. R. Gray, it truly belongs to the *Passeres*, and forms part of the family of kingfishers. The species are all American. They have an air of stupidity, and are remarkable for their solitary habits. *T. macrorhynchus* is a native of Brazil, where it may be observed frequenting open cultivated spots near human habitations, perching on some withered branch of a low tree. There it will sit nearly motionless for hours, only changing its position to dart at a passing insect, and then return to its withered twig again. At times the bird raises the feathers of its head so as to appear not unlike a puff-ball—whence its English name. They are confiding birds, and the colours of their plumage are sombre, and not gay like the barbets, with which they have generally been arranged.

Tamus.—A genus of monocotyledonous plants belonging to the nat. ord. *Dioscoreaceæ*. It contains several species of twining herbs, natives of the temperate parts of Europe and Asia. The root is tuberous, the leaves are cordate, and the flowers are succeeded by a berry. *T. communis*, common black bryony, is the type of the genus. It grows on the hedges and thickets in England, and generally throughout Europe, and its stem is long and twining, reaching a length of ten feet, and upwards. The berry is red when ripe, is nearly the size of a cherry, and is unwholesome, though not actually poisonous. The root is thick and tuberous. When fresh it is very acrid, but when properly prepared it yields a quantity of fecula which may be used as an article of food.

Tanacetum. *The Tansy.* A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*. A number of species are contained in this genus, which are herbaceous or suffruticose, and dispersed over the whole surface of the globe, though most abundant in Europe and Central Asia. Their leaves are generally very much divided, and their flowers are yellow, and disposed in terminal corymbs. Nearly 100 species are described, but the one which is best known is the common tansy, *T. vulgare*. This plant grows in waste places throughout Great Britain and over all Europe, and is remarkable for the strong aromatic odour which it exhales from all its parts. It has a bitter, nauseous taste, and has been esteemed to possess tonic, exciting, and emmenagogue properties. The leaves in some places are placed in beds to drive fleas from them, and in country places the young leaves are used to flavour puddings, and to make tansy cakes.

Tanagra. *The Tanagers.*—See TANAGRINÆ.

Tanagrinæ.—A sub-family of birds belonging to the conirostral tribe of the order *Passeres*, and family *Fringillidæ*. The numerous species belonging to this group originally formed the genus *Tanagra* of Linnæus. They are characterized by a conical, slightly arched beak, triangular at the base, shorter than the head, and strongly notched at the tip. In their habits they resemble the rest of the fringillidæ. They live upon berries, insects, and grains. Their flight is rapid, and their movements are quick and active. They are arboreal birds, seldom descending upon the ground, and amongst them are some which inhabit retired places, whilst others show themselves in the neighbourhood of human habitations, in gardens and meadows. In general they live in flocks, but some unite only in families, whilst others remain solitary. Almost all of them are remarkable for the richness and variety of their colours, and some amongst them add to the beauty of their plumage the agreeableness of their song. The tanagers are confined to the New World, and to the hot parts of it. The genus *Tanagra* may be taken as the type of this sub-family, and *T. episcopus* may be considered the typical species. This bird is a native of Cayenne, and possesses a violet coloured plumage, the small covertures of the wings being of a bluish-white, the middle one shaded with violet, the large ones ash-coloured, and the feathers of the wings and tail blackish, bordered with blue. The scarlet tanager of America belongs to the genus *Piranga*, and is a very handsome bird. It is about 6½ inches long, and the male, during the love season, is scarlet-red, with the wings and notched tail black. He is a migratory bird, spending his winter in tropical America, and passing from that in the month of May to the United States, and as far north as Canada. He is shy and unsociable, taking up his abode in the deepest recesses of the forest, and rarely approaching the habitation of man. The female bird is not possessed of such gaudy plumage, her dress being a dull green, inclining to yellow; and this is the colour which the male also assumes in autumn and winter.

Tanghinia.—A genus of plants. See APOCYNACEÆ.

Tantalinæ, Tantalus.—A sub-family and genus of birds, containing the ibis, &c. See ARDEIDÆ.

Tapes (*tapes*, industry).—A genus of shells. See VENERIDÆ.

Tapirus. *The Tapir.*—A genus of pachydermatous animals belonging to the order *Ungulata*, and family *Elephantidæ*. There are only two or three species, but they form a small sub-family by themselves, *Tapirina*. They are characterized by having the muzzle prolonged into a small, mobile, but scarcely prehensile trunk, simple at the end, a very short tail, and three pairs of cutting teeth and one pair of small canines in each jaw. They have four toes on anterior, and three on posterior feet. *T. terrestris*, or *Americanus*, the American tapir, the best known species, is a native of South America, and is about 3½ feet high and about six feet long. The skin is very

thick, and covered with a scanty coat of very short closely adpressed hair. The colour is nearly a uniform brown, passing into gray upon the head and chest. In its native haunts the tapir is by no means savage, and is more of a nocturnal than a diurnal animal. The inmost recesses of deep forests are its chosen haunts, and it takes readily to the water. It is a powerful animal, and it is said that if the jaguar springs upon it, it dashes through the thickest part of the wood, crushing its enemy against the trees and other obstacles in its path. It lives upon vegetable matters, fruits, &c.; and when young it may be easily domesticated. This species appears to have a very extensive range, being found in every part of South America to the east of the Andes, from the Straits of Magellan to the Isthmus of Darien. Its highest range, however, appears to be from 3,000 to 3,600 feet above the level of the sea; the more mountainous parts being inhabited by another species which is but indistinctly known. *T. Malayanus*, or *Indicus*, the Indian tapir, is common in the island of Sumatra. It is of a heavy, massive appearance, and of a glossy black colour, with the exception of the back, rump, and sides, which are white, and separated by a defined line from the parts that are black. Its trunk is seven or eight

Tapirus Malayanus—Indian Tapir.

inches long, its eyes are very small, and the ears are roundish, and bordered with white. Its habits and disposition are very nearly the same as the American species, and the individuals which have been sent to this country have been very mild and gentle. Remains of at least three fossil species of *Tapirus* have been found in the tertiary formations of France and Germany; and the fossil genera *Palæotherium*, *Lophiodon*, and *Coryphodon*, have been also referred to the sub-family *Tapirina*.

Tarandus. *Reindeer.*—See CERVINA.

Tardigrada (*tardus*, slow; *gradior*, to walk).—A term used by Cuvier to distinguish a family of animals contained in his order *Edentata*, and composed of the sloths. See BRADYPUS. The same word is used by zoologists to designate a family of minute animals belonging to the class *Arachnidæ*, and order *Colepoda*, and commonly called *Water-Bears*. The family contains a number of species which are found in stagnant fresh water, patches of wet moss, and the gutters on tops of houses. They are remarkable for the power they have of recovering vitality after having been kept dry for some years.

Tarsius. *The Tarsier.*—A genus of quadrumanous animals belonging to the family *Lemuridæ*. The genus is characterized by the head being rounded, the muzzle short, the eyes very large, posterior limbs much elongated, and the tail long and tufted at the extremity. The fingers of the hands are furnished with delicate nails, while those of the hinder extremities have them only on the thumb and the two outer fingers, the index and middle fingers being provided with a sharp, compressed, slightly curved claw, like the thorn of a rose bush. Two or three species are described, natives of the islands of the Indian archipelago. They are nocturnal animals, feed chiefly on lizards, and leap well. They hold their prey in their fore hands, while they rest on their haunches.

Taurichthys (*taurus*, a bull; *ἰχθύς*, a fish). *Buffalo-fish.*—A genus of acanthopterygious fishes belonging to the family *Chætodontidæ*. There are only two species known, both remarkable for their form and appearance. They are of an uneven sub-rhomboidal shape, higher than long, have a protuberance on the occiput, and a horn opposite the middle of each orbit. A species of this genus is figured by some of the early ichthyologists under the Malay name of *Skankarbauw*, or buffalo-fish, and for a length of time was looked upon with great distrust as a fantastic representation from their own imaginations. Recent naturalists, however, have lately discovered a species of fish in the Indian archipelago which agrees remarkably well with those early representations. This species, *T. varius*, is from four to six inches long, and about the same height as length. The horn on the orbit is sharp and recurved, it has a remarkable protuberance above the head, and the spinous rays are compressed and unequal. It is remarkable, besides, for its singular distribution of colours.

Tautoga.—A genus of fishes belonging to the order *Pharyngognathi*, and family *Cyclo-Labridæ*. The species are about nine in number, and are distinguished by having a double row of strong conical teeth on both jaws, while the integument of the face is thick, scaleless, and of considerable extent. One of the species, *T. nigra*, the black tautog, a native of the North American seas, is held in high esteem, and at New York is in such request for the table that it sells in the market there at the rate of eight lbs. for a dollar. It is kept in stews to fatten. It is tenacious of life, but in great colds becomes torpid, and will not eat. When the winter is over, and the dogwood (*cornus florida*) comes into flower, then it is in high season.

Taxaceæ. *The Yew family.*—A nat. ord. of dicotyledonous plants belonging to the section *Gymnospermæ*. According to some botanists,

they form a sub-family of the nat. ord. *Coniferæ*. The species are trees or shrubs, having a woody tissue, marked with circular discs, and evergreen and mostly narrow, rigid, entire, and veinless leaves. They are but thinly distributed over the surface of the earth, and are mostly natives of temperate parts of Europe, Asia, Africa, and America. Like the *Coniferæ*, they possess resinous properties, and some of the trees belonging to the family are valued for their timber. The genus *Taxus* is the type; composed of several species of evergreen trees, natives of Europe and North America. *T. baccata* is the common yew, a tree well known in most parts of Europe, and found in all parts of Great Britain and Ireland. The yew is a low tree, seldom exceeding thirty feet in height, and is seldom seen growing in company with its own species, but generally alone, or with other species of plants. It is of slow growth, and continues growing for 100 years, after which it usually ceases to grow, though it will live for many centuries. The tallest tree in England is said to be that growing in the churchyard of Harlington, near Hounslow, and is fifty-eight feet high. The yew trees at present existing at Fountains Abbey, in Yorkshire, are supposed to have attained their full growth when the Abbey was erected in 1132. The yew appears to have been employed from the earliest times in the manufacture of bows. Those used by the English previous to the introduction of gunpowder, were made of yew, and there are many allusions amongst English poets to this use of the wood. Its leaves and seeds are said to be narcotico-acrid.

Taxodites.—Fossil plants found in the tertiary formations, and allied to the recent genus *Taxodium*.

Taxodium.—A genus of dicotyledonous plants belonging to the section *Gymnospermæ*, nat. ord. *Compositæ*, and sub-order *Cupressineæ*. This genus is composed of trees, natives of North America, having pendant branches, narrow, deciduous, alternate, and distichous leaves. The strobiles or cones are globular, and their semi-ligneous scales are almost peltate and angular. *T. austichum*, the typical and best known species, is a native of the New World, growing in the temperate parts of Mexico, at an elevation of from 5,000 to 7,000 feet, and abounding in the swamps and along the river courses of the eastern portion of North America, within the limits of 43° north latitude. It is a tree which acquires colossal dimensions. A specimen exists in the gardens at Chapultepec, in Mexico, known by the name of the cypress of Montezuma, which is nearly forty feet in circumference, and another is mentioned growing near Oaxaca, which measures ninety feet, and is surrounded with five or six others, all of them nearly of the same size as that at Chapultepec. This species of taxodium is known by its wide-spread horizontal branches, and its linear distichous leaves. It is called the *Deciduous Cypress*, and the low grounds in Louisiana, &c., where it is extremely abundant, are called cypress swamps. A remarkable peculiarity is seen in the growth of this plant. A number of conical exostoses become developed upon the roots of large individuals, rising often to the height of six feet above the ground. These productions chiefly show themselves upon those trees which are liable to be covered by inundations. They are always hollow, united at their surface, and covered with a reddish bark, like that of the roots. The wood of this tree is harder than that of the pine, and is made use of in the United States, especially in Louisiana, for many purposes, as in the construction of houses and boats, for masts of ships, &c. The exostoses on the roots are often used for making bee-hives.

Taxus. *The Yew.*—A genus of plants See TAXACEÆ.

Tecoma.—A genus of dicotyledonous plants belonging to the nat. ord. *Bignoniaceæ*, and originally forming part of the genus *Bignonia*. The species are numerous, upwards of sixty having been described. They are for the most part natives of the warm parts of America, some, however, growing at the Cape of Good Hope, and a few in Australia. They are trees and shrubs, some of the latter being climbers, with opposite, pinnated, or digitate leaves, the leaflets generally dentate or serrate. They possess large yellow or red flowers. One of the best known species is *T.* (*Bignonia*) *radicans*, a climbing shrub, which is frequently cultivated for the purpose of covering walls and trellis work. It grows well upon walls with a good exposure, clinging to them like ivy, and covering them with a beautiful green foliage, from the midst of which are sent out numerous terminal corymbs of fine scarlet flowers. It is commonly called the *trumpet-flowered Jasmine*.

Tectona. *The Teak Tree.*—A genus of dicotyledonous plants belonging to the nat. ord. *Verbenaceæ*, and deriving its name from the Indian name tekka or theka, used by them to designate the principal species. The most important, if not the only species, is *T. grandis*, a large tree, a native of India, the wood of which is well known by the name of teak. This wood is extremely valuable, being of great use in building ships, as it is very hard, and of longer duration than the oak. The tree grows to a large size, and is remarkable for its long leaves, which are from twelve to twenty-four inches long, and from eight to sixteen inches broad. It grows in many parts of the continent of India, but the most extensive forests are those extending along the Irrawady in Pegu. It is useful for many other purposes besides ship-building; for instance, the Malays employ a decoction of the wood for the cure of cholera; the flowers are considered diuretic, and the leaves are astringent and serve to dye red.

Tegenaria.—A genus of spiders. See ARANEIDÆ.

Teidæ. *The Teguexins.*—A family of reptiles belonging to the order *Saura* or lizards, sub-order *Leptoglossæ* or slender-tongued lizards, and natives of the New World. The species described do not exceed thirty-two in number, and none of them are of much importance. The genus *Teius* may be taken as the type. The teguexin, or variegated lizard, *T. teguexin*, is one of the largest species, measuring as much as four or five feet in length. It is a native of the warm parts of America, and feeds upon fruits, insects, serpents, toads, young chicks, and eggs. It ordinarily dwells in fields and the borders of woods, but when in danger will take to the water and swims well, its long and slightly compressed tail serving it as an oar. It is said to be fond of honey, and in order to procure it without fear of the bees, it comes forward at intervals, gives the hive a blow with its tail and runs away, and this it repeats till the bees are wearied out and fairly driven from their home.

Teius.—A genus of lizards. See TEIDÆ.

Teleosaurus (τελειος, perfect; σαυρος, lizard).—A fossil genus of crocodiles. See CROCODILIDÆ.

Telephorus (τηλε, far off; φορος, carrier).—A genus of pentamerous *Coleoptera* belonging to the family *Lampyridæ*. The species belonging to this genus are numerous, more than 200 having been observed, and they are found in all parts of the world. The body is of an elongate, somewhat depressed form, and smooth. They are found on plants of various kinds, in great numbers, in spring. They are carnivorous beetles, and it has even been observed that the females have thrown the males upon the ground and gnawed the abdomen and fleshy parts of the neck. The larvæ are found in sand and moist earth, and live upon worms, &c. Degeer observed a curious fact with regard to a species of this genus. He had once or twice noticed in Sweden, a great number of worms, insects, and larvæ of *Telephorus*, in the midst of the snow in winter. How they came there was a difficulty which he wished to solve. It was only during and immediately after the occurrence of a storm of wind, that this fall of insects had been observed, and he came to the conclusion, that the hurricanes which accompanied or preceded the phenomenon, having blown down a number of fir trees at a considerable distance off, had carried along with it a quantity of the loose earth from the roots of the prostrate trees. In this earth he believed were contained these insects and larvæ, and the wind, after carrying them for a length of time in the air, had at length deposited them, along with the snow which had fallen, in the places where he had found them.

Telfairia.—A genus of dicotyledonous plants described also under the name of *Joliffia*. It contains only one species, which is a very curious shrub, growing native on the south-east coast of Africa. The negroes there call it kouème. It is a climber, and throws off pendant branches 100 feet long. The leaves are stipulate, digitated, the five large leaflets which compose them being ear-shaped outwardly, and accompanied with a cirrhus two feet long. The fruit is of an enormous size, two or three feet long and eight inches thick. The pulp is bitter, but the seeds, an inch broad, are edible. A good sweet oil is obtained from them, and for this purpose the plant is cultivated both in Africa and the islands of Bourbon and Mauritius.

Tellina.—A genus of *Mollusca* belonging to the class *Conchifera*, and forming the type of the family *Tellinidæ*. The shells of this genus, which are often beautifully coloured, are transverse or orbicular, slightly inequivalve, generally compressed, and with the posterior extremity angular, and presenting the appearance of an irregular fold. They have two cardinal teeth in each valve, and two laterals, often very wide apart, and generally most distinct in the right valve. The ligament is always external and prominent. The animal has two slender, diverging siphons, twice as long as the shell. There are two or three sub-genera, and in all about 200 species have been described. They are found in all seas, but more especially in the Indian Ocean, and are most abundant and highly coloured in the tropics. Upwards of 130 species have been found fossil, chiefly in the oolites.

Tellurium.—A metal discovered in 1782. The ores of tellurium are various. Native tellurium is found crystallized and massive. Its colour is tin-white or steel-gray, and it occurs in regular six-sided prisms. Specific gravity 5·7 to 6·1; hardness 2·25. It consists of tellurium, iron, and gold. It is found at Maria Loretto Mine at Facebay near Zalathna, in Transylvania. Graphic tellurium occurs crystallized. It is of a steel-gray colour, and is found in right rhombic prisms. Specific gravity 5·723 to 8·28; hardness 1·5 to 2. It consists of tellurium, gold, silver, and lead. Its name is derived from the crystals being arranged like written characters. It is found at Offenbanya in Transylvania. White or yellow tellurium occurs in imbedded crystalline laminæ, the primary form being a right rhombic prism. It is of a silver-white colour, inclining to brass-yellow, opaque, and of a metallic lustre. Specific gravity 10·678. It consists of tellurium, gold, silver, lead, and sulphur. Found at Nagyag in Transylvania. Black tellurium found in the same situation, contains copper in addition to the other constituents, and bismuthic tellurium or tellur bismuth, which is found in Norway, contains bismuth and traces of selenium along with tellurium and sulphur.

Temnurus.—A genus of birds. See GLAUCOPIS.

Tenebrionidæ.—A family of insects belong-

ing to the order *Coleoptera*, distinguished by having the elytra not soldered together, with the wings fitted for flight. The genus *Tenebrio* contains one species which is well known. This species, *T. molitor*, is the meal worm beetle, and its larva, commonly called the *Meal Worm*, is very injurious to flour, meal, bran, &c. It frequents corn mills, granaries, bakehouses, &c., and is also very destructive to ship biscuits packed in casks, which when opened are found eaten through in holes. These larvæ are greedily devoured by nightingales and other insectivorous birds, and are accordingly bred by bird-fanciers.

Tenorite.—Black copper ore. See COPPER.

Tenthredinidæ. *The Saw-flies.*—A family of insects belonging to the order *Hymenoptera*, and section *Terebrantia*. The species are very numerous, and are distinguished by having a short cylindrical body, short antennæ, and the abdomen closely united to the thorax, so as to appear as only one. The females are furnished with an ovipositor which is toothed like a saw, and hence the English name of the family. With this organ they bore small holes in twigs and the stems of plants, and deposit their eggs in the holes so made. At the same time they secrete from the mouth a kind of froth which has the faculty it is said of preventing these openings from closing up. In general appearance the larvæ of the saw-flies are very different from those of the other hymenopterous insects, resembling on the contrary those of the lepidoptera, though they differ in having a greater number of feet. They live upon leaves, many of them rolling the leaf up and fastening it by means of silky fibres. When arrived at maturity they spin a silky cocoon in which they lodge themselves, either upon the plants on which they lived or on the ground, and there await their metamorphosis. The genus *Tenthredo* may be looked upon as the type of the family. It is characterized by having the upper wings with four sub-marginal cells, and the antennæ with the third and fourth joints of equal length. It contains a good many species.

Tenthredo.—See TENTHREDINIDÆ.

Tenuirostres.—A tribe of birds belonging to the great order *Passeres*, containing those species which have a long and slender bill. This tribe contains the hoopoes, UPUPIDÆ; the sun birds, NECTARINIDÆ; the humming birds, TROCHILIDÆ; the honey-eaters, MELIPHAGIDÆ; and the creepers, CERTHIIDÆ.

Tephrosia (τεφρος, ash coloured).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, sub-order PAPILIONACEÆ. The species are herbs or tender shrubs, peculiar to the hot parts of the globe. They are generally covered with a silky down, which gives them an ashy-gray colour. Their leaves are stipulate and pinnate, and their flowers are white, flesh coloured, or violet, disposed in racemes. The legume is linear, compressed, straight, or curved, and the seeds are compressed and angular. The species are numerous, upwards of 100 having been described. *T. tinctoria*, the Ceylon indigo, is a native of the island of Ceylon, and is known there by the name of anil. Its tissue yields a blue colouring matter which has the same properties as indigo, and is used in Ceylon for the same purposes. The leaves of *T. senna*, or buga senna, are purgative, and in the province of Popayan, of which district it is a native, they are used as a substitute for the real senna. The root of *T. toxicaria*, the poison tephrosia, a native of the West Indies and Guiana, is used there to poison fish. The whole plant indeed contains a narcotic poison, and a small quantity of the leaves pounded and thrown into the water where there are fish, renders them stupid as if intoxicated, and causes them to float on the surface. It does not communicate its poisonous effects to the flesh of the fish. *T. piscatoria*, the fisher's tephrosia, is used in India, of which country it is a native, for the same purpose as the last, and *T. emarginata* is employed in like manner in South America.

Teratologia (τερας, monstrosity; λογος, a discourse).—A special name adopted by comparative anatomists for that particular branch of science which treats of deviations from the normal type of organization. At first used for monstrosities of the animal kingdom, it has now been extended by botanists to include also deviations from nature in the vegetable world. The study of teratology, as applied to the animal kingdom, has of late years had much attention paid to it by men of science, particularly in France and Germany; and laws have been laid down by which the subject has been raised to the rank of a distinct science, with its special language and nomenclature. In the course of this work, a number of articles have been introduced which treat particularly of different kinds of monstrosities, or, as they used formerly to be called, "lusus naturæ." M. Geoffroy St. Hilaire may be considered as the founder of this branch of science, and to him we are indebted for the name, and for a scientific classification. He divides monstrosities into two large groups or classes. I. Single monstrosities, UNITARII, containing all those cases in which there exists only the elements (either complete or incomplete) of one single individual. II. Compound monstrosities, *Compositæ*, containing those cases in which there are the elements (more or less complete) of more than one individual.

Terebellidæ.—A family of tube-inhabiting worms. See ANNELIDA.

Terebellum.—A genus of gasteropodous *Mollusca* belonging to the family *Strombidæ*, and now called *Seraphs*.

Terebratula.—A genus of shells. See BRACHIOPODA.

Teredo.—A genus of conchiferous *Mollusca* belonging to the family *Pholadidæ*. The animals which compose this genus are elongate and worm-

like. The shell is thick, very short, globular, open both in front and behind, and lodged at the inner extremity of a burrow, partly or entirely lined with shell. This tube is cylindrical, straight, or flexuose, and closed at its mouth by small calcareous pallets. The most remarkable species of the genus is the ship-worm, *T. navalis*, so well known for its ravages in wood. It is ordinarily a foot long, but sometimes attains a size of 2½ feet. It attacks wood immersed in sea water, as piles, piers, and ships. It always bores in the direction of the grain, unless it meets with another teredo or a knot in the wood. In 1731-32, it caused great alarm in Holland on account of the immense damage it did to the piles, and its destructive powers have often been very seriously felt on ships' bottoms. Metal sheathing and broad-headed iron nails have been found most effectual in protection of these articles. The young of the teredo, which is generally ovoviviparous, when it leaves the body of its mother, swims by means of its vibratile cilia, and soon after birth begins to walk by means of a very long tongue-shaped foot. It is then enclosed in a bivalve shell, which is smooth and glabrous. About twenty-four hours after birth it fixes itself on the wood, which it immediately begins to perforate, and then commences secreting the tube. Another species is the giant teredo, *T. arenaria*, which is often a yard long, and two inches in its greatest diameter. The end of the tube is divided lengthwise, and sometimes prolonged into two diverging tubes. *T. corniformis* is found burrowing in the husks of cocoa nuts and other woody fruits floating in the tropical seas. Its tubes are extremely crooked and contorted for want of space. The fossil wood and palm fruits of Sheppy and Brabant are mined in the same way. About fourteen recent, and twenty-four fossil species have been found and described.

Termes.—The white ant. See TERMITIDÆ.

Terminalia.—A genus of dicotyledonous plants belonging to the nat. order *Combretaceæ*. The genus is composed of trees and shrubs, with alternate, exstipulate leaves, and apetalous flowers disposed in spikes. The species are numerous, natives of the tropical parts of Asia and America, and many of them used in medicine and the arts. *T. angustifolia* (*T. Benzoe*) is a native of India, and yields, on tapping, a gum resin very similar to the true benzoin, and possessing the same properties. This resin is dry, hard, fragile, inflammable, and of a sweet penetrating odour, especially when it burns. When it first flows it is thin, white, glutinous, and transparent, but soon becomes hard by exposure to the air, and assumes a reddish-yellow colour. This substance is employed in medicine in diseases of the lungs, as a perfume and a cosmetic. *T. vernix*, a native of the Moluccas and China, and called by the Chinese *Tsi-tchu*, yields by incision the celebrated varnish of China, which is employed to lacquer the various little articles of furniture imported to this country, and so much esteemed for their brilliancy and solidity of colour. When it first flows, this juice is milky, dirty white, thick and viscous, but by exposure to the air soon condenses, becomes of a yellowish-brown, and is reduced at last into a black resin, hard, brilliant, and friable as mastic or sandarac. When fresh it is very caustic, producing ulceration of the skin when incautiously touched. The people employed in collecting it are obliged to wear boots, gloves, and a mask for the face, and police regulations demand that they rub their bodies with olive oil. Even with these precautions, few it is said escape a disease consisting of pustules all over the skin, and known by the French under the name of "Clous de Vernis." The fruits of *T. Belerica* and *T. Chebula*, both natives of the East Indies, and known by the name of myrobalans, are used as astringents, and for dyeing. A durable ink is made by mixing the salts of iron with an infusion of the outer rind of the fruit. Both of them are subject to the attacks of insects, producing gall nuts, and these galls possessing the astringent principle in abundance, are used for dyeing. The fruit of *T. Catappa*, however, a native also of the East Indies, yields a seed which is edible, and an oil is procured from it in the same manner as from the almond.

Terminology.—That branch of the science of natural history, the object of which is to explain the various terms or words of a peculiar import which occur in the description of natural objects.

Termitidæ. *White Ant family.*—A family of insects belonging to the order *Neuroptera*, and characterized by having wings with few transverse nervures, folding horizontally; tarsi four-jointed; antennæ short and moniliform; body depressed. The species are tolerably numerous, and are generally known by the name of white ants. They are chiefly confined to the tropics, a few, however, extending into temperate regions. Though these neuropterous insects have little affinity with the hemipterous insects the true ants, yet in their habits they resemble them strongly; they are, however, more formidable, and travellers have transmitted to us numerous observations upon the ravages caused by them. Like the ants, as well as bees and wasps, they are composed of three kinds of individuals, males, females, and neuters, or workers. They unite in societies composed each of an immense number of individuals, living on trees, and in the ground, and often attacking the woodwork of houses. When they live on the ground, they erect dwellings in the form of pyramids or cones, sometimes with a roof, and often of such a size and so numerous that they resemble the huts of savages. When they attack woodwork, they form innumerable galleries, all of which lead to a central point, and in their work they seem carefully to avoid piercing the surface of the wood. Hence the articles which they have perforated appear per-

fectly sound, when the slightest touch is almost sufficient to cause them to fall in pieces. The larvæ of these insects resemble very nearly the perfect insect, excepting that they possess no wings. When full grown, the head is large and rounded, and besides the ordinary compound eyes, they have three ocelli or simple eyes situated on the upper surface of the head. The antennæ are as long as the head and thorax, and composed of eighteen joints. The abdomen is terminated by two small jointed appendages. The neuters, however, differ from the males and females in possessing no wings. They are said to defend the nests; and stationing themselves near the outer surface, they are the first to make their appearance when their habitation is disturbed. They attack the party molesting them and bite with considerable strength. *Termes bellicosus* is a species found on the coast of Africa, and is the largest and best known. The nests of this species are in the form of sugar loaves, and rise to the height of ten or twelve feet. They are bare till they are six or eight feet high, but in time become, like the rest of the earth, almost covered with grass and other plants, and in the dry season when the herbage is burnt up by the rays of the sun, they somewhat resemble very large haycocks. Each community consists of a king and queen, soldiers as they are called, and labourers. These latter are the most numerous, there being at least a hundred of them to one soldier. They are about a quarter of an inch long, run extremely fast, and appear to be incessantly occupied. The soldiers appear to be the same insects in a farther stage of development, and are about half an inch long. The males and females are possessed of wings, and are about six or seven-tenths of an inch in length. At the proper time these perfect insects issue forth from the nest in immense numbers and take flight. It is generally at the first commencement of the rainy season that they begin to emigrate, and as their wings are only calculated to carry them for a few hours, the numbers that perish by the heavy rains is enormous. It is said that perhaps not more than one pair out of many thousands get into a place of safety. The fortunate pair which do succeed, are generally found by some of the labouring insects that are continually running over the surface of the ground under their covered galleries, and are immediately elected king and queen of a new colony. The queen when pregnant assumes an immense size. The abdomen extends and enlarges so much, that in an old queen it will increase so as to become 1,500 or 2,000 times the bulk of the rest of her body, and 20,000 or 30,000 times that of a labourer. It becomes in fact one immense matrix, full of eggs, and when the insect begins to lay it will protrude 60 in a minute, or 80,000 and upwards in the course of twenty-four hours. These eggs are instantly taken from the queen by her attendants, and carried to a part of the ant-hill called the nursery, to be hatched, and afterwards attended to, and brought up till the young are able to shift for themselves. The white ants have many enemies. Ants, birds, and reptiles destroy them in great numbers, and the natives of the country where they are found, eagerly seek after the wingless kinds, and devour them with the greatest avidity. Luckily in Europe little is known of the ravages of these insects, but about twenty-three years ago, a small species named *Termes lucifuga*, was observed in some of the departments of the west of France. At Rochelle, the ravages committed by this little pest caused considerable alarm, and various methods were devised in order to destroy them. The best method was ascertained to be, the introduction into the woodwork attacked of a jet of gas, of either sulphuric or chloric acid. This gas introduced under a pressure of a quarter or half an atmosphere, was found to penetrate through the galleries caused by their attacks; and when used at the period of reproducing their young the insects were successfully destroyed.

Ternstroemia (a proper name).—See TERNSTROEMIACEÆ.

Ternstroemiaceæ. *The Tea family.*—A nat. ord. of dicotyledonous plants, composed of shrubs or trees, with alternate, coriaceous, exstipulate leaves, which are sometimes dotted. They are simple, entire, and generally covered with a shining, silky down. The flowers are large, generally white, sometimes pink, or red, and arranged in axillary or terminal peduncles. The genus *Ternstrœmia*, which gives its name to the family, is composed of trees and shrubs which are natives of tropical America. They have coriaceous leaves and solitary axillary flowers. The most important plants, however, which belong to this family are those producing tea, and the showy flowers known as Camellias. See THEA and CAMELLIA.

Terricolæ. A group of worms.—See ANNELIDA.

Testacea (*testa*, a shell).—A word often used to designate the *Mollusca* in general, but more particularly those which are covered with a shell.

Testacella.—A genus of terrestrial gasteropodous mollusca belonging to the inoperculate *Pulmonifera*. At first sight the animals composing this genus might be taken for slugs, the body being elongated and limaciform, and tapering towards the head. They possess, however, an external shell, which is small, ear-shaped, and situated on the posterior extremity of the body. The respiratory orifice is on the right side, covered by the shell. The testacella is subterranean in its habits, feeding on earth worms, and visiting the surface only at night. During winter and dry weather it forms a sort of cocoon in the ground by the exudation of its mucus.

Testudinaria.—A genus of monocotyledonous plants belonging to the nat. ord. *Dioscо-*

reaceæ. One species, *T. elephantipes*, the tortoise plant of the Cape, or elephant's foot, is pretty well known in collections, on account of its peculiar shortened and thickened stem, looking like an elephant's foot. It is covered with a soft corky bark, which is rugged and rough, and from the top of the thick stem a climbing stem is sent which bears the leaves and flowers.

Testudo. *The Tortoise genus.*—See CHELONIA.

Tethya.—A genus of sponges of a globular form, tuberose, and of a cariose firm substance, strengthened by abundance of simple spicula, arranged in bundles, and diverging from the centre to the circumference.

Tetrabothrium (τετρα, four; βοθριον, sucker).—A genus of *Entozoa* or intestinal worms belonging to the order *Cestoidea*, family *Tæniidæ*, and distinguished by the head being provided with four appendages of suckers, in the form of small ears or the petals of a flower. The species are parasitic in the intestines of the weasel, the seal, and several sea birds. It forms with some authors only a section of the genus *Bothriocephalus*.

Tetrabranchiata (τετρας, four; βραγχια, gills).—A name given to the second order of the class *Cephalopoda*, containing the *Nautili*, *Ammonites*, and *Orthoceras*.

Tetragonia (τετρας, four; γωνια, angles).—A genus of dicotyledonous plants belonging to the nat. ord. *Ficoideæ* or *Mesembryaceæ*. It is composed of herbaceous or somewhat shrubby plants, natives of the islands of the southern hemisphere. The leaves are fleshy, flat, alternate, or opposite, and those of one species, *T. expansa*, the New Zealand spinach, were found by Captain Cook to be exceedingly useful as an antiscorbutic. Since then the species has been introduced into Europe and cultivated as a pot-herb, many people considering it to equal the common spinach in good qualities.

Tetragonolobus (τετρας, four; γωνια, angle; λοβος, lobe).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and consisting of herbs with broad leafy stipules, trifoliate leaves, winged petioles, and flowers on axillary peduncles. The legume is cylindrical, furnished with four foliaceous wings, which give it a four-cornered appearance—hence its name. The purple-winged pea, *T. purpureus*, a native of the south of Europe, with dark purple flowers and pilose stems, may be taken as the type. The legumes are eaten in the same manner as we eat French beans.

Tetragonurus (τετραγωνος, triangular; ουρα, a tail).—A genus of acanthopterygious fishes belonging to, and forming the type of a small family *Tetragonuridæ*. Only one species, *T. Cuvierii*, has been described, a fish which is found in the Mediterranean at great depths. It has an elongate body, covered with hard, toothed, and striated scales. Its colour is black, but its flesh when cooked is white and tender. It has been found, however, that when eaten, it often produces violent poisonous effects, and it is asserted that this peculiar property is given to it by its food, which consists of *Acalephæ*, known to be acrid and caustic.

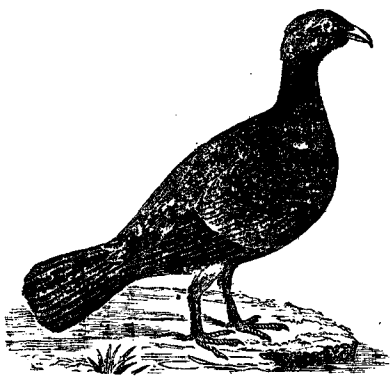
Tetranthera.—A genus of dicotyledonous plants belonging to the nat. ord *Lauraceæ*. *T. Roxburghii*, a native of the mountains of India and China, has a globose, black fruit, about the size of a pea, yielding a kind of greasy exudation, from which the Chinese manufacture a bad quality of candle.

Tetrao. *The Partridge and Grouse genus.*—See TETRAONIDÆ.

Tetraodon.—A genus of fishes. See DIODONTIDÆ.

Tetraonidæ.—A family of birds belonging to the order GALLINÆ, and corresponding nearly with the genus *Tetrao* of Linnæus. This family contains many species of well known birds, as the partridges, grouse, blackcock, &c., and has lately been divided into several sub-families. The sub-family *Perdicinæ* contains the partridges, francolins, quails, &c. See PERDIX. The sub-family *Rollulinæ* contains only one genus, *Rollulus* or *Cryptonyx*, the species of which are beautiful birds, inhabiting the great forests of the Malayan peninsula, Sumatra, and Java. They are wild, and very shy of the presence of man. The sub-family *Odontophorinæ* contains a number of species, mostly natives of America, and represented by the genus *Ortyx*. See PERDIX. The sub-family *Tetraoninæ* is characterized by the species having a strong but short beak, the upper mandible arched, curved towards the tip, longer than the inferior; nostrils half-covered by a scale, and concealed by feathers; tarsi plumed; toes rough on the edges, wings short, rounded; and tail rounded, and sometimes forked. The habits of the *Tetraoninæ* are sociable; they live in families, and choose for their place of abode, wooded mountainous districts or plains covered with brushwood. Like the common fowl, they roll in the dust, and are polygamous. They roost upon trees at night, or take refuge there from their enemies; but during the day they reside and seek their food upon the ground. Their flight is heavy, short, but rapid; when they walk, they do so with a grave and easy step; and when they run, they do so rapidly. Their food consists chiefly of berries, the young buds of pines, firs, and birches, grains, worms, and insects. The morning and evening are the times they seek their food, as during the day they retire to secluded and unfrequented spots. They pair in spring, at which time the males have a peculiar cry, that in one or two species can be heard three or four miles off. The females make their nest on the ground, and the young, when hatched, remain with the parents during the autumn and winter. The males of one species, *Tetrao (Cupidonia) Cupido*, the pinnated

grouse, when the females are sitting, unite in families by themselves, and at that time are continually fighting. They leap one or two feet in the air, and utter most discordant cries, which have been described like those of a person who is violently tickled, and which we are told, when heard, dispose the hearer, from sympathy, almost



Tetrao urogallus—The Capercailzie.

to laugh aloud. *Tetrao urogallus*, the capercailzie, or cock of the woods, is the type of the family. It is the largest of all the species, and is a native of most parts of the north of Europe, the north of Asia, and Siberia. Formerly it was an inhabitant of the north of Scotland, but had almost completely disappeared, till of late years great pains have been taken to re-introduce it from Norway and Sweden. It is a magnificent species, two feet nine inches in length, nearly four feet in alar extent, and from eight to fourteen pounds in weight. Its general colour is black and green, with white marks on the wing and tail coverts. In the pairing season the male utters a singular cry to attract the female; a cry which resembles the whetting of a scythe, and may be heard at a considerable distance. *T.* (*Lyrurus*) *tetrix*, the blackcock or heathcock, is another fine species, a native also of the northern parts of Europe, and abundant in some parts of Scotland. It is two feet in length, and in the expansion of the wings two feet nine inches. The prevailing colour of the plumage of the male is black, richly glossed with blue, with a bar of white across the wings. The feathers of the tail, when spread out, form a curve on each side. The ruffed grouse is another fine bird, a native of America. This and some other species belong to the genus BONASA, which see. The genus *Lagopus* contains the well known birds called ptarmigan and red grouse. See LAGOPUS. Two other sub-families have been created—*Turnicinæ*, represented by the genus *Turnix* or *Hemipodius*, which contains several species found in Europe and Asia, &c.; and *Caccabininæ*, represented by *Caccabis rufus* and one or two other species, natives of India.

Tettigonia. *The Leaf-hoppers.*—A genus of hemipterous insects. See CERCOPIDÆ.

Teucrium.—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*. The species are numerous and widely spread. They are herbs and shrubs, with a variable habit and inflorescence. Three are found in Great Britain. *T. Scorodonia*, the wood germander, is not uncommon in situations where the soil is dry and stony. In Jersey it is called ambroise, and the inhabitants use it as a substitute for hops in making their beer, many people preferring the bitter taste of this plant to that of hops.

Teuthydidæ. *The Teuthyoids.*—A family of acanthopterygious fishes, of an oval, compressed form, the species of which are entire strangers to European seas. They have a family physiognomy which makes them easily recognizable, and are common in the Indian and Pacific Oceans. Their mouth is small, not protractile, and their uniserial teeth are confined to the jaws, the palate and tongue being destitute of them. Many of the genera have the sides of the tail armed, or are endowed with a recumbent spine in front of the dorsal fin. They feed upon marine algæ, and frequent the coral basins of the eastern seas, where the clearness of the water allows them to be distinctly seen. Seven genera are described, and a good many species are known. See ACANTHURIS, NASEUS, &c.

Textor.—A genus of birds. See PLOCEINÆ.

Thalarctos (*θαλασσα*, the sea; *αρκτος*, bear) *The Polar Bear.*—A genus of mammalia. See URSIDÆ.

Thalassidroma (*θαλασσα*, the sea; *δρομας* a runner).—The genus to which the stormy petrel belongs. See PROCELLARIIDÆ.

Thalassina.—A genus of crustaceans. See MACROURA.

Thalictrum. *Meadow Rue.*—A genus of dicotyledonous plants belonging to the natural ord. *Ranunculaceæ*, and consisting of herbs which are natives for the most part of the temperate and colder parts of the world. They have usually a fetid smell like rue; hence their English name. Two or three species are found in Great Britain. The yellow meadow rue, *T. flavum*, grows in wet meadows, the banks of rivers and ditches, and has a root of a yellow colour, which resembles rhubarb. It yields a yellow dye, which has been used for dyeing wool; and in former times it was employed as a remedy for jaundice.

Thallite.—A mineral substance. See EPIDOTE.

Thallogenæ (*θαλλος*, a green leaf; *γενναω*, to produce).—A division of acotyledonous plants, called also *Thallophytes* and *Cellulares*, and containing those acotyledonous plants which are composed of cellular tissue, having neither stem, nor leaves, nor stomata, and are reproduced by spores. In this division are contained what are

called the lowest forms of vegetable life, forms which, from their extreme simplicity of structure, puzzle both the botanist and zoologist. Several families of the minuter of these forms have been described by the zoologist as animals, and were for a time securely placed in a niche in the animal kingdom, soon, however, to be reclaimed by the botanist, and transferred by him in triumph to a twig of the many-branched vegetable world. Some late observers, indeed, assert that they can at pleasure sow a crop of what are acknowledged now to be plants, and after a succession of changes reap a crop of animals! The species of thallogens are exceedingly numerous—their name is legion. The faces of mountains, trees, and rocks, are covered with them; the surface of the earth and substances upon it teem with them, and oceans, lakes, and rivers are full of their tiny forms. They constitute three large orders:—I. The lichens, *Lichenes*. Lichens are plants which appear in the form of a foliaceous, crustaceous, or pulverulent expansion or *thallus*, with spores on the frond, in the form of protuberances of various kinds. They are found in all quarters of the globe, adhering to, and often covering the surface of stones, rocks, trees, &c. They appear, during at least a part of their growth, to be capable of deriving most of their nourishment from the atmosphere. They have the power of acting on hard rocks, so as to disintegrate them in process of time. Some of the species are useful articles of food, and others afford important dyes. The Iceland moss, *Cetraria islandica*, contains a nutritious matter called *Lichenin*, or lichen starch, and it possesses a bitter principle also, which is called *Cetrarin*. As a demulcent and tonic, it has considerable reputation, and is given in the form of decoction or jelly in pulmonary affections. The natives of the arctic regions, and more particularly those of Iceland, of which countries it is a native, use it extensively as an article of food. They collect it once in three years, and only in a moist state of the atmosphere; for when dry it is so fragile as to fall, in collecting it, into powder. Previous to using it they macerate it in water for twenty-four hours, in order to extract its bitterness, and then boil it in milk. They also reduce it to powder, and mix it with flour, so as to make cakes, and this kind of food is said to be wholesome and nourishing. The reindeer moss, *Cladonia rangiferina*, is of immense importance to the natives of the north of Europe, as it affords the chief nourishment of their reindeer. The tripe de roche, a species of the genus *Gyrophora*, affords a sort of nourishment to man, scanty, it is true, but available for the arctic traveller and northern hunter, and upon which our gallant countryman, Franklin, and his companions, subsisted for some time. The valuable dye called archil, orchil, or "argol," is derived from one or two species of *Roccella*, *R. tinctoria* and *fuciformis*, which grow abundantly in the Canaries and in the Cape de Verde islands. This dye was for a long time in the hand of some Florentine merchants, and kept secret by them. In the year 1300, one of the family of Rucellarii or Rucellai carried on a flourishing trade in the Levant, and returning to Florence with great wealth, was the first to make known the art. It forms a considerable article of commerce with Europe. Its colouring matter appears to depend upon the presence of a principle called *Orsine*. The well known substance called litmus, so much used as a chemical test, is derived from the same plants. The dye called *Cudbear* is procured from *Lecanora tartarea*; and the *Parmelia tinctoria* of this country affords another useful dye of a yellow colour.—II. The mushrooms, *Fungi*. The fungi are cellular plants, which generally appear in the form of a more or less rounded *thallus*, supported upon a stalk, and with spores or seeds on the under surface or gills, or, as it is called, the *hymenium*. By far the greater part of them live in the air, very few in the water, often making their appearance upon the surface of decaying organic matter, and in general are very fugacious, springing up in a night, arriving at maturity by noontide, and disappearing with the close of the day. They are found in all parts of the world, and are extremely numerous, upwards of 4,000 species having been enumerated. Many of them are extremely interesting, and worthy of attention, because some are useful as articles of food; others are poisonous in their qualities, and many are the cause of great destruction to fruits and vegetables, from their parasitic growth. The common mushroom, *Agaricus campestris*, is the species which in this country is most used as an article of food, and is cultivated for that purpose. From it is obtained the sauce called ketchup. It is a curious fact that this species is considered poisonous in Italy, whilst several others in that country, in France, and Russia, which are reckoned unsafe to eat in Great Britain, are extensively used by the natives. The fairy-ring mushroom, *Agaricus pratensis*, which is so well known from the curious property it possesses, of always appearing in regular rings, is also an edible mushroom in this country, being chiefly used for mixing with rich sauces. The truffle, *Tuber cibarium*, is also a mushroom, and its commercial value is very great. In Rome it is stated that the yearly average of taxed mushrooms, from 1837 to 1847, was between 60,000 and 80,000 lbs. weight. In Terra del Fuego the inhabitants almost live upon a species of mushroom which grows on the bark of the beech of that country, *Cyttaria Darwinii*; and in Australia many species of *Boletus* are used by the natives, one of them, *Mylittus australis*, being commonly called native bread. *Agaricus* (*Amanita*) *muscaria*, on the other hand, is a poisonous species. It is used by the natives of Kamtschatka and Korea to produce intoxication. In the Russian language it is called moucho-more; and the people who drink this plant, infused in some

liquor, are seized with convulsions in all their limbs, followed by a raving delirium, during which they are often impelled to commit suicide or assassination. It is difficult to distinguish between edible and poisonous mushrooms. Their growth is remarkably rapid. Ward mentions one having been seen by him to grow three inches in the course of twenty-five minutes, while another has been known to increase in a night from the size of a pea to that of a melon. Some species of fungi are possessed of a phosphorescent quality, as the *Rhizomorphæ*, and give the natural arches of certain mines the appearance of enchanted vaults, teeming with undescribable splendour. The destruction caused by minute parasitic fungi upon our cereal and other useful plants is sometimes immense. The mildew of the wheat, for instance, arises from the attack of a small fungus, called *Puccinea graminis*. When this little pest becomes multiplied to a great extent, it gives rise to fearful consequences. The disease called smut, attacking the flower of the wheat, is the produce of a minute parasite, called *Uredo segetum*. Under the attack of this destructive fungus the ears of the wheat become masses of black, sooty powder. The bunt, or disease attacking the seed itself, is caused by, *Uredo fœtida*, which, as soon as it enters the grain, completely fills it, and replaces the flour by a black, disgusting, fetid powder. This powder consists of minute balls, four millions of which may exist in a single grain. The disease which attacks rye and other grain, called ergot, or cock's spur, is produced by a minute fungus, called *Spermædia clavus* by some botanists. This disease, though not very injurious to the crops, is remarkable for the poisonous properties it possesses, with regard to those who use the diseased grain as food. Mortification in the limbs takes place, and severe sufferings, and even death, are the frequent results. The disease affecting the potato is not yet properly known, but it is at least intimately connected with the attacks of a species of *Botrytis*, *B. infestus*. *Botrytus destructor* is very injurious to the different species of *Allium*, as the onion, &c.; while parsnips, lettuces, vetches, and pease, are alike subject to attacks from other species of these fungi. The disease which attacks dry wood, and causes so much destruction to it, commonly called dry rot, is caused by a small fungus named *Merulius lacrymans*, which in the course of its development destroys the texture of the wood, and makes it crumble to pieces. Some of these parasitic fungi grow on living animals. The disease called muscardine in the silk-worm is produced by the balsamo or *Botrytis Bassiana*, and several species of caterpillars are affected in a peculiar manner. One of these caterpillars, the body of which becomes perfectly transformed into the substance of the fungus, and which is caused by a species of *Sphæria*, *S. sinensis*, is used extensively in China as a drug, the virtues of which are much vaunted by the natives of that country.—III. Sea-weeds, *Algæ*. The algæ are cellular plants, which live either in the water, both salt and fresh, or in very damp places, and are composed of fronds of various kinds, growth taking place by the division of cells, or by cellular prolongations, in the form of lateral branches. They are nourished through their whole surface by the medium in which they live, and are propagated by spores which are contained in mother cells. They are widely distributed over the globe, some of the species being of gigantic growth, and others extremely minute or microscopic. In many of them the spores are provided with ciliary processes, which for a time exhibit spontaneous movements, and are called zoospores. Many of these retain their cilia and active movement throughout life, and have in consequence been considered and described as infusorial animals. See DIATOMACEÆ. The species are numerous, upwards of 2,000 having been described. Amongst the *Fuci* or true sea-weeds, some of the species are very useful to man. Kelp is procured from several species, the bladder fucus, *F. vesiculosus*, being, however, the one most generally collected for that purpose. The kelp trade was at one time of great importance in this country, but very little is now manufactured. Iodine and bromine are two important substances procured from *fuci*; *Laminaria buccinalis* of the Cape of Good Hope being one from which the largest quantity of the former substance is procured. The celebrated gulf weed, *Sargassum vulgare*, is remarkable for the immense quantities in which it occurs in certain portions of the ocean, extensive fields being sailed through for days together. Some of the species are edible, as *Chondrus crispus*, the Carrageen moss. *Rhodymenia palmata* the dulse, *Laminaria digitata*, the tangle, &c. afford nutritious articles of diet. The edible swallows' nests of China, of which about £284,290 sterling worth are annually exported from the Indian archipelago to the Chinese market, are said to be formed by the birds from a species of *Galidium*. These birds are principally found in Java, in caves usually situated on the sea coast. The work of getting the nests is one of extreme danger. When obtained, they are simply dried without direct exposure to the sun. The common price at Canton for the best sort is about £5 18s. 1½d per lb. In the British seas, *Scytosiphon filum* attains the length of forty feet; while in the Pacific Ocean, *Macrocystis pyrifera* often reaches to more than a thousand feet. Sea-weed forms an excellent manure for the land. In Scotland it is very much used; and in the Channel Isles, under the name of *vraick*, it forms an article of much importance to the farmer. Bleached and dried it serves also the purpose of fuel. Amongst the *Confervæ* there are several species which tinge whole oceans with their peculiar colour. *Trichodesmium erythræum* is sometimes developed in such prodigious quantities in the Red Sea, that

the water is coloured red by them, and most probably has given the name to the sea. In China, the cause of the colour of the Hoang Hai, or yellow river, is said to depend upon the presence of myriads of these same minute confervæ, which have there assumed a yellow colour. The red snow of the arctic regions owes, in part at least, its colour to the presence of *Protococcus nivalis*, and the red stains which occur on white-washed walls of cellars, resembling those of blood, and sometimes giving much occasion for alarm to timid persons, are produced by *Palmella cruenta*. The *Charas* are jointed, leafless plants, with verticillate branches, frequently encrusted with calcareous matter, and possessing a disagreeable odour, which they impart to the water in which they grow. The miasma of the Campagna of Rome is said to be caused by their immense numbers. The stems of these plants are used by the microscopist to exhibit the circulation of the sap. The species are found in stagnant fresh water, and also in salt, in all parts of the world. See CHARACEÆ.

Thamnophilus.—A genus of birds belonging to the family of butcher birds. See LANIIDÆ.

Thanasimus.—A genus of beetles. See CLERIDÆ.

Thaumantias.—A genus of *Acalephæ*. See MEDUSA.

Thea. *The Tea Plant.*—A genus of dicotyledonous plants belonging to the nat. ord. *Ternstræmiaceæ*. This genus is composed of shrubs or small trees inhabiting the hilly districts of China. They have alternate, petiolate, rather coriaceous leaves, slightly dentated or serrated, and white flowers, which are solitary on axillary peduncles. This is the genus which yields the tea of commerce. Considerable discussion has taken place concerning the tea plants. Some botanists make three distinct species, whilst others consider them as only varieties of one. *T. viridis*, which is said to yield the green tea of commerce, is a large, strong growing shrub, with spreading branches, and leaves from three to five inches long. *T. Bohea*, said to yield the black tea, is a smaller plant, with an erect stem, stiff, straight branches, and leaves not above half, or two-thirds of the size of the former species. *T. Assamensis*, the Assam tea, appears to partake of the characters of both the others. Although these three species may be distinct, it seems to be proved by Mr. Fortune's researches that the green and black teas of commerce do not depend upon specific differences, but that in the northern tea districts of China black and green teas are both obtained from the same species or variety, viz., the one called *T. viridis*; whilst in the Canton tea districts both black and green teas are made from the species called *T. Bohea*. The quality of the tea depends much on the season when the leaves are picked, the mode in which it is prepared, as well as the district in which it grows. Green tea contains more essential oil and tannin than black tea, and it is understood that the colour, which distinguishes the various kinds of this tea, is derived from the application of an extract of indigo, and of Prussian blue, and gypsum; whilst the fine odour which renders other kinds of tea remarkable is communicated by mixing with them leaves of *Olea fragrans*, a species of *Camellia*, and other plants. The peculiar principle contained in tea is called *Theine*, and, from being highly charged with azote, is said to contain a great amount of nutritive matter. Green hyson tea has been found to contain from 2·4 to 2·56 per cent.; black congou 1·02 per cent.; and Assam black tea 1·37 per cent.; while gunpowder is said to contain 6·22 per cent. The tea plant is one of the principal sources of wealth of the Chinese empire, immense quantities being imported into England, Russia, and America, whilst in China itself it is in universal use, in fact, an absolute necessary of life. In 1846 the imports of tea into the United Kingdom were, black, about 43,000,000 lbs.; green, about 13,000,000 lbs.—total, 56,000,000 lbs. In 1667 the East India Company imported tea for the first time, to the amount of 100 lbs.! Russia and Holland are the two principal European states that, next to England, import most. America is the largest importer of green tea, England of black. In China there are three crops annually—the first in spring, of the young leaves, with the bloom upon them, and which yields the finest and most delicate kinds of tea; the second, one month later; and the third, when the leaves have attained their full growth. This crop furnishes the great bulk of the tea of commerce. Tea is now cultivated in India to a considerable extent, and in Assam it appears to thrive well. It is cultivated also in Ava, the people of which country use it largely as a kind of *pickle preserved in oil!*

Thecadactylus (θηκη, sheath; δακτυλος, finger).—A genus of saurian reptiles. See GECKOTIDÆ.

Thecidea.—A genus of mollusca. See BRACHIOPODA.

Thecla.—A genus of diurnal lepidopterous insects known to collectors by the name of *Hair streaks*. The exotic species are numerous, but only six or seven are met with in Great Britain.

Thecodontosaurus (θηκη, sheath; οδους, tooth; σαυρος, lizard).—A genus of extinct saurian reptiles, the remains of which have been found in the dolomitic conglomerate of Redland, near Bristol. This is the oldest or lowest division of the new red sandstone, and *Thecodontosaurus* is considered one of the oldest of vertebrated animals excepting fishes.

Thelphusa (a proper name).—A genus of crustaceans. See THELPHUSIDÆ.

Thelphusidæ.—A family of *Crustacea* belonging to the brachyurous *Decapoda*, and section *Catometopa*. The species belonging to this family are all terrestrial, living in the earth, near the banks of rivers or in humid forests; bearing

in this respect a strong analogy to the land crabs. *Thelphusa fluviatilis*, the type of the genus, is a native of the south of Italy, Greece, Egypt, and Syria. It is about 2½ inches long, and is of a yellowish colour. It is found burrowing into the earth on the banks of rivers and streamlets, and appears to have been well known to the ancients. It is considered to be the crab mentioned by Hippocrates, and noticed by Aristotle, under the name of heracleotic crab; and may be seen represented on ancient medals. *Potamia*, or *Boscia dentata*, is a native of the West Indies and South America, and is about two inches long. Its habits are the same as the last, but it is peculiar from having the branchial cavities raised, and clothed inside with a tomentose membrane covered with vegetations.

Thenardite. *Native Anhydrous Sulphate of Soda.*—A mineral occurring in rhombic octohedron crystals, and found in coatings at the bottom of some lakes at Espartine near Madrid. It is composed of sulphate of soda and a small portion of carbonate of soda, and is used in making the chemical preparation carbonate of soda.

Theobroma (*θεος*, god; *βρωμα*, food). *The Cacao.*—A genus of dicotyledonous plants belonging to the nat. ord. *Bythneriaceæ*. The species are trees which resemble the cherry, and are natives of equatorial America. The fruit is contained in a ligneous pericarp, generally five to eight inches in length, and of a yellow or bright scarlet colour. The seeds are about the size of a small bean, enveloped in a pulp of the consistence of butter, and are well known in commerce and in domestic use as cacao or cocoa, from which is prepared the well known substance called chocolate. Long before the discovery of America, the Indians had cultivated the trees which produce this fruit, and were accustomed to its use as a beverage. The Caribs named the tree *Cacao*, the Mexicans called it cacâhoaquaitl, and the fruit they named *Cacahoatl*, the beverage made from it they called *Chocolatl*, from which is derived our word *Chocolate*. There are several species which produce this fruit, though the most common and best known is *Theobroma Cacao*. The different species produce different qualities, but they all contain an oily product which thickens naturally, and then assumes the name of butter of cacao, resembling real butter in consistence and colour. It is used in medicine for forming ointments, and quacks vaunt its virtues as a cosmetic. The preparation of chocolate gives immense employment, especially in France, where it is very much used by all classes. The bean or fruit, roasted like coffee, is powdered very fine, and then mixed with sugar, arnotto, vanilla, and cinnamon. This mixture is again bruised by means of an iron cylinder, and afterwards made into cakes, moulds, &c. The cultivation of the cacao tree is carried to a great extent in the colonies. The best harvest is in December, but there is another crop, though a smaller one, collected in June. Each tree will produce from two to three lbs. of beans. A peculiar principle, analogous to caffeine, exists in cacao, which is called theobromine.

Theraponidæ.—A family of acanthopterygious fishes, separated from the family *Percidæ*, and constituted to receive those species of percoid fishes which possess six branchiostegals instead of seven, and with the ventral fins having five soft rays and one spine. They are scaly fishes, the scales being either ctenoid or cycloid, and some of them have the lower rays of the pectorals formed so as to constitute organs of touch. Twenty-six genera have been described containing about 120 species.

Thespesia (*θεσπεσιος*, divine).—A genus of dicotyledonous plants belonging to the nat. ord. *Malvaceæ*, and composed of trees with large entire leaves. *T. populnea* is a native of the East Indies, Guinea, and the Society Islands, and is commonly called by the English colonists the umbrella-tree. It grows to a height of about forty feet, and has large yellow flowers, with a dark red centre. It is considered by the Catholics a sacred tree, and is planted about their monasteries and convents.

Thethys.—A genus of sponges. See SPONGIIDÆ.

Thomisus.—A genus of spiders. See ARANEIDÆ.

Thoradelphus.—A genus of monsters. See MONOCEPHALII.

Thorite.—A mineral substance of a black colour, brilliant, and resembling in appearance obsidian. It is found in sienite in Norway. A remarkable discovery was made at the same place of a new earth which has been called *Thorina*. Thorite contains 57 per cent. of thorina, and is in combination with silica, and several metallic bodies, as iron, manganese, uranium, &c. Specific gravity, 4·7; hardness, 5. Before the blowpipe it becomes yellow.

Thrasaetus. *The Harpy Eagle.*—See AQUILINÆ.

Thrips.—A genus of insects. See THYSANOPTERA.

Thuja or **Thuya** (*θυω*, to burn).—A genus of dicotyledonous plants belonging to the nat. ord. *Coniferæ*, sub-order *Cupressineæ*. The species composing this genus are evergreen trees, natives of North America, Asia, and Africa. They are much branched, and are remarkable for the distichous disposition of their branches. Their leaves are scale-like, closely imbricated, or compressed. They are commonly known by the name of *Arbor Vitæ*. One of the best known species is the Oriental arbor vitæ, *T. orientalis*, a native of Siberia, China, and Japan. A more useful species is the Western or American arbor vitæ, *T. occidentalis*. This is a fine pyramidal tree, is a native of America, extending from Canada as far south as Virginia and Carolina, and grows to a height of from forty-five to fifty feet,

with a girth of nine feet. It is known in the Northern States by the name of the white cedar, and is much valued for its durability. It forms excellent palisades for enclosures, &c.

Thylacinus (*θυλακος*, pouch; *κυων*, dog).—A genus of marsupial animals. See DASYURUS.

Thylacotherium (*θυλακος*, a pouch; *θηριον*, animal).—A genus of fossil marsupial animals.—See MACROPIDÆ.

Thymallus. *The Grayling.* — See SALMONIDÆ.

Thymelæaceæ. *The Daphne family.*—A nat. ord. of dicotyledonous plants composed of shrubs chiefly, with alternate or opposite, entire, exstipulate leaves, and found growing in various parts of the world, both in warm and temperate regions. It derives its name from a plant formerly called *Thymelæa*, which is now only a synonym of the genus DAPHNE, which see. The bark of many of the plants belonging to the order is acrid and irritant, and the fruit often narcotic. The fruit of *Dirca palustris*, leather wood, is particularly so, and the seeds of the species of *Hernandia* are slightly purgative. The seeds, however, of *Inocarpus edulis* are eaten when roasted, and have the taste of chestnuts.

Thymele.—A genus of diurnal lepidopterous insects belonging to the family *Hesperiidæ*, and known by the name of skippers.

Thymus. *The Thyme.*—A genus of dicotyledonous plants belonging to the nat. ord. *Labiatæ*, composed originally of numerous species, many of which are now, however, scattered over several other allied genera. At present they number from twenty to thirty, and are small undershrubs, scattered over the greater part of Europe, especially in the Mediterranean regions, and in the temperate parts of Asia. Their leaves are linear, entire, veined, with revolute edges, and the flowers are generally purple, and accompanied with bracteæ. One of the best known species is the wild thyme, *Th. Serpyllum*, which grows on hills and in dry pastures in Great Britain, throughout nearly all Europe, the north of Asia, and Africa. Its odour is well known, aromatic, and penetrating; and by distillation giving out a volatile oil which abounds in camphor. Its taste is bitter, and at one time it was considered and used as a tonic and antispasmodic. The common thyme, *T. vulgaris*, is found abundant in waste places in the south-west and south of Europe. It grows in the form of a small undershrub, and is even more aromatic than the preceding species. It is very much cultivated in kitchen gardens, and is much used for culinary purposes.

Thynnus. *The Tunny.*—A genus of fishes. See SCOMBERIDÆ.

Thysanoptera (*θυσανος*, fringe; *πτερον*, a wing).—An order of insects, lately separated from the order hemiptera, to contain those insects formerly known as the genus *Thrips*. They are characterized by the possession of long, narrow, membranous wings, which are nearly rudimentary, and almost destitute of nervures, but fringed on the sides with numerous, close set cilia. The antennæ are filiform, and generally longer than the head, and their eyes are large, and occupy the sides of the head. The species are very small, seldom exceeding a line in length. They live upon vegetable matter, and many of them commit great devastation, attacking in some cases the flowers, and in others the leaves, which they erode throughout the whole length without penetrating them. Cereals, especially the wheat are attacked by one species, *Thrips cerealium*, our crops in some seasons sustaining severe injury, and the olive suffers from the effects of another. The metamorphosis of these insects is what is termed incomplete. The larvæ are only distinguishable from the perfect insect by the absence of wings, and by being of a yellow or reddish colour. After repeated moultings they assume wings, and lose their colour. They have chiefly as yet been observed in France and England, but no doubt are very common throughout the world, though their history has not been much attended to.

Thysanura, or **Thysanoura** (*θυσανος*, fringes; *ουρα*, tail). *Fringe-tails.*—An order of insects, containing a considerable number of species which are apterous, and are remarkable for possessing at the side or the extremity of the abdomen an apparatus which enables the insects to move and even leap to a considerable height. They undergo no metamorphosis, and though wingless are very agile, and escape from an attempt to seize them either by rapid run or a sudden leap. They are generally covered with shining scales, and live inside houses, under stones, in rotten wood, or among decayed vegetable matters. The greater number are natives of Europe, several, however, being found in America or Africa, and a few in Asia. They have been divided into two families, *Lepismadæ* and *Poduridæ*. See LEPISMA and PODURA.

Tichodroma.—A genus of birds. See CERTHINÆ.

Tigridia. — A genus of monocotyledonous plants belonging to the nat. ord. IRIDACEÆ, and containing only one species, *T. pavonina*. This plant is a native of Mexico, and is one of the most beautiful of the family to which it belongs. Its long longitudinal, pleated, sharp ensiform leaves, are ranged on the two opposite sides of the stem, and its flowers handsome, singularly formed and coloured, are large, but of short duration. It is now cultivated in Europe in the open air.

Tigris.—The genus to which the tiger belongs. See FELINÆ.

Tilia. *The Lime-Tree.*—See TILIACEÆ.

Tiliaceæ. — A nat. ord. of dicotyledonous plants, composed of trees or shrubs, the greater number of which are natives of tropical climates, a few only being found in temperate regions. Their stipulate leaves are for the most part alternate, simple, entire, or lobed, crenulate or

lentated, often coriaceous, and strongly veined underneath. Their flowers are axillary or terminal, solitary or corymbiform, and sometimes accompanied with a bractea. Like the malvaceæ, to which they are allied, they abound in a mucilaginous juice which gives them emollient properties, though in some instances the bark possesses an astringent and bitter principle. The species are numerous, and have been arranged in two sub-orders, *Tilieæ* and ELÆOCARPEÆ (which see). The genus *Tilia* is the type of the order, and is composed of handsome trees, which are generally known by the name of lime or linden trees. They are natives of Europe, and the northern parts of Asia and America. The leaves are elegant, heart-shaped at the base, sharply acuminate at the apex, and accompanied with deciduous stipulæ, whilst the flowers are fragrant, disposed in yellowish panicles, and attached to a narrow elongate bractea. The common lime-tree, *Tilia Europæa*, is a well known tree which occupies a prominent position in almost all our plantations, as well as those of Europe generally. It is a handsome tree, finely proportioned, and capable of acquiring by age a large size. One of the most remarkable specimens is the lime-tree of Neustadt, in Wurtemberg, which in 1831 measured upwards of thirty-six feet in circumference. The wood of the lime-tree is close-grained, and of a pale or nearly white colour. It is in consequence in much demand for carving, in cabinet-making, and more especially for the "touches" of pianos. The bark is tough and flexible, which causes it to be employed in making ropes, &c. The Russian mats used by gardeners and upholsterers are made from it. The flowers are remarkably sweet-scented, and as they contain a great quantity of nectar, are great favourites with bees. On the continent, an infusion is made of them which is considered to be an excellent antispasmodic, and is much used. The seeds contain a large quantity of albumen, and when dried and mixed with a certain proportion of the flowers are made into a kind of chocolate.

Tillandsia.—A genus of plants. See BROMELIACEÆ.

Tilletia.—A genus of coniomycetous *Fungi*, comprising a number of minute species which are known by the name of *bunt*, and which are very destructive to various kinds of corn, attacking the ears, and converting the internal substance of the grain into a fetid black powder. *T. caries* (*Uredo caries* of some botanists) attacks wheat in this manner, as well as other grain.

Tillus.—A genus of beetles. See CLERIDÆ.

Timalia.—A genus of thrushes. See TURDIDÆ.

Tin.—A metal of a fine white colour like silver, and when fresh of great brilliancy. It has a slightly disagreeable taste, and emits a peculiar smell when rubbed. Spec. grav. 7·285. Tin is very malleable, tinfoil or leaf tin being about $\frac{1}{1000}$th part of an inch thick, and might be beat to half this thickness. Its hardness is between that of gold and lead, but its ductility and tenacity are not nearly equal to either. A bar of tin a quarter of an inch in diameter, cannot support a weight of 296 pounds without giving way, and a tin wire $\frac{1}{16}$th of an inch in diameter would be broken by forty-seven pounds. Tin is very flexible, and emits a peculiar crackling sound when bent. It is found native in the state of peroxide or tinstone, but in comparatively few places. It occurs in considerable abundance in Cornwall; in the mountains separating Galicia from Portugal; in Saxony and Bohemia; Malacca and Banca; Mexico and Peru. This ore occurs in two kinds of deposits—in veins, mixed with some other metals, forming the common tinstone; and in loose rounded masses or grains in alluvial soil, forming what is called stream tin. The tin reduced from the ore occurring in veins is most impure, and is called block tin; that occurring in alluvial soil is much purer, and yields what is called grain tin. The tin mines of Cornwall have been worked from a very remote period. It is generally allowed that the islands called Cassiterides, to which the Phœnicians traded for tin, were the Scilly Islands and western extremity of Cornwall. In modern times they have been worked with various degrees of energy and success, and the annual average produce at the present time may be estimated at 4,500 tons. Next to Cornwall, the mines of Banca and Malacca yield the largest quantity of tin. As the tin obtained in those countries is all alluvial ore or stream tin, it is purer than that obtained in Cornwall, and were the numerous mines occurring in the Malayan countries properly worked, they would prove the richest in the world. Tin is used in various ways. As it is not acted on by the air, it is very much employed for covering other metals. Iron is tinned to prevent its rapid oxidation when exposed to air and moisture, and copper is tinned, to avoid the injurious effects to which those who are in the habit of employing cooking utensils made of this metal are always liable. Tin plates, or white iron as they are often called, a substance in extensive use, are formed of thin iron plates dipped into molten tin. The tin not only covers the surface of the iron, but penetrates it completely, and gives the whole of it a white colour. Solutions of tin in nitric, muriatic, nitro-sulphuric, and tartaric acids, are much used in dyeing, as giving a degree of permanency and brilliance to several colours to be obtained by the use of no other mordants with which we are at present acquainted. We have no precise information as to the purposes to which the ancients applied this metal, but it has been supposed that the Phœnicians were acquainted with the use of a solution in nitro-muriatic acid, for fixing their famous purple dye. Alloyed with lead, or antimony, it forms pewter. In the shape of tinfoil, it is applied, with the addition of mercury, to cover

the surface of glass, forming looking-glasses, mirrors, &c. Bisulphide of tin, obtained by subliming a mixture of tin, mercury, salammoniac, and flour of sulphur, forms the substance called mosaic gold.

Tinamus.—A genus of birds belonging to the order *Gallinæ*, and forming the type of the family *Tinamidæ*. The birds belonging to this family have a moderate sized, rather slender, somewhat lengthened beak, depressed at the base, and obtusely rounded at the point. The tarsi are rather long, and covered in front with large scales. The wings are short and concave, and the tail very short, in some quite rudimentary. The species belong exclusively to the American continent, and represent there the partridge of Europe. They are gentle, timid birds, but, it is said, cannot be domesticated. During the greater part of the year they live in flocks, only at pairing time living in couples. Like the partridges they fly heavy, with a bounding motion, low and horizontal, and they do not rise till forced by the close proximity of the intruder. They run, however, with great rapidity, and escape from their enemies by this means. Some of them live in meadows amongst high grass, others in wild uncultivated places, or they retire into woods. These latter are remarkably indolent in their habits, remaining quiet almost the whole day in the same place without moving. It is chiefly in the morning and evening they seek their food, which consists of grains, fruits, insects, and small worms, and in search of which they scratch the ground in the same manner as the common fowl. The males have a peculiar cry, consisting of a kind of trembling, plaintive whistle, which they use as a note of warning, or to attract the female. The female makes her nest on the ground in a small hollow, which she covers with dry herbs, and lays twice a-year. Some of the species are esteemed as excellent food. *T.* (*Rhynchotus*) *rufescens*, a native of the great plains of the neighbourhood of Maldonado, and about 15½ inches in length, is hunted as game by the inhabitants. Its flesh, when cooked, is said to be delicately white.

Tinca. *The Tench.*—A genus of fishes. See CYPRINIDÆ.

Tinea. *Clothes' Moth*, &c.—See TINEIDÆ.

Tineidæ.—A family of small nocturnal lepidopterous insects, corresponding to the Linnæan genus *Tinea*. These little moths are characterized by having simple, slender antennæ, in the males of some species pubescent on their under surface, the head densely covered with scales, and generally a long and slender body. The wings are entire, generally long and narrow, the lower ones broadly fringed on the internal edge, and entirely concealed by the upper when in a state of repose. The larvæ are usually naked, or only slightly hairy, and possess a scaly plate on the first segment, and sometimes another on the last. Though small in size, the perfect insects are equally beautiful as many that excel them in size, their wings being often spotted with gold and silver in relief. Their number is immense, upwards of 1,000 species having been noticed, whilst the genera into which they have been divided amount to more than fifty. The moths themselves are harmless, but the larvæ of many are exceedingly destructive. Some of them are only too well known for the mischief they occasion to woollen clothes, furs, feathers, and the dried skins of animals, &c. They gnaw away the soft parts of these various substances, and construct of them cases in which they reside, and in which, when full grown, they undergo their transformation. Other species are equally destructive to some of our cereal crops, and others still, commit great havoc in bee-hives, feeding upon the honey and forming galleries in the honeycomb. The genus *Tinea* is the type of the family, and contains about twenty species, natives of Europe alone. *T. granella*, having the upper wings marked with brown, and the down on the head of a reddish colour, is the species which is so hurtful to the crops of wheat. It unites several grains together with a kind of silky substance, and of this constructs a case in which it resides, and out of which it sallies forth at times to gnaw the seeds. It attacks in this way both the growing wheat and that stored up in our granaries. *T. pellionella*, of a silvery-gray colour, with one or two spots of black on the wings, is the species which causes so much injury to skins, furs, &c. *T. sarcitella*, an abundant species over all Europe, with whitish shining wings, spotted with black on their upper surface, is the species which destroys woollen stuffs and clothes, and is so well known under the common name of clothes' moth.

Timarcha.—A genus of beetles. See CHRYSOMELIDÆ.

Tinnunculus.—A genus of birds belonging to the family *Falconidæ*, and having as its type the kestrel, *T. Alaudaria*. This bird is a native of Great Britain and of Europe generally, and has most of the habits of the group to which it belongs. *See* FALCONINÆ.

Tipula.—See TIPULIDÆ.

Tipulidæ. *Crane-flies.*—A family of insects belonging to the order *Diptera*, and division *Nemocera*. Their principal characters are—proboscis short, thick, ending in two large fleshy lips; antennæ longer than the head; simple, rarely pectinate; palpi longer than proboscis; eyes entire, ocelli obsolete. The insects of this family, like the gnats, have the body and legs long and slender, the wings narrow, elongate, and the balancers or halteres naked, and proportionately longer than those of the other diptera. They live in meadows, gardens, and woods, and in autumn clouds of some of the smaller species may be seen flying in the air, hovering over some particular spot, and ascending and descending in a vertical line with a humming noise.

The larvæ are worm-like, and some are aquatic, others live in dust and filth; some live in fungi, others form galls, and others again live in the ground, feeding upon the roots of grass. The species are found scattered over the whole globe, and as they are numerous they have been arranged in several sub-families or tribes—as the gnat-like species, *Chironomides* (see CHIRONOMUS); the gall-forming species, *Cecidomyides* (see CECIDOMYIA). The genus *Tipula* is the type of the whole family, and more especially the ground-living species, *Tipulides*. They are generally known by the name of crane-flies or daddy-long-legs, and are not numerous in species; but the larvæ of some of them are very injurious to grass fields. The females deposit their eggs in the ground, the larvæ are hatched there, and when numerous they destroy the herbage by gnawing the roots of the grass. The perfect *Tipulæ* resemble a good deal the gnats in appearance, though generally much larger, but they are not troublesome insects like them. They are chiefly found in meadows, sometimes on the edges of pieces of water, and at other times in woods.

Titanium.—A metal found in a black sand in the bed of a rivulet in Cornwall, and entering into the composition of several minerals. *Titanite* is a peroxide of titanium, and is found in quartz in primary rocks in Scotland, Bohemia, and Switzerland, &c. It is frequently more or less mixed with oxide of iron and manganese. The titaniates of iron are not uncommon.

Tityra.—A genus of fly-catchers. See MUSCICAPIDÆ.

Tococca.—A genus of plants. See MELASTOMACEÆ.

Todus. *The Todies.*—A genus of birds belonging to the fissirostral tribe of the order *Passeres*, family *Coraciidæ*, and forming the type of a small sub-family, *Todinæ*. The species are principally natives of the warmer parts of America and the West Indies. Their beak is peculiarly flat or depressed, blunt at the end, and with the gape extending as far back as the eyes. They are birds of gaudy plumage and rapid flight, and feed upon insects, worms, small reptiles, &c. The typical species, *T. viridis*, the green tody, is an elegant little bird about the size of a small wren. The upper surface of the body is of a fine vivid green, and the throat is of a very fine red colour. It is very common in Jamaica, and appears to be a very tame bird. It hops about the twigs of low trees, searching for small insects, and occasionally uttering a low and hissing note. When seen at repose on a twig, or patiently waiting for an insect, it draws its head backwards, the beak pointing upwards, and its loose plumage puffed out, which gives it an air of stupidity that it by no means possesses. The green tody is exclusively an insect feeder, and burrows in the earth to breed.

Tonicia.—A genus of gasteropodous *Mollusca*. See CHITONIDÆ.

Topaz.—A mineral substance of a vitreous lustre, and always crystallized. These crystals are white, yellow, green, or blue, hard enough to scratch quartz, and so brilliant in their plane of cleavage as to be readily distinguished by that alone. Spec. grav. 3·5; hardness 8. Topaz is composed of silica, alumina, and fluoric acid. Before the blowpipe it is infusible, but with borax dissolves slowly into a colourless glass. Some are phosphorescent when fragments are exposed to a strong heat, and others become electric; by friction acquiring positive electricity. There are a considerable number of varieties of form in topazes, but the most valuable and most beautiful is the true topaz of commerce, or the gem topaz. The crystals of this variety occasionally acquire a considerable size, some having been found several inches in diameter. They are chiefly brought from Brazil and Siberia. The true topaz is always transparent or translucent, and varies in colour. The Brazilian topaz is of a deep wine-yellow colour, and the deeper the tinge the more valuable is it esteemed. Indeed, there are few gems more universal favourites than the yellow topaz when perfect. A fine stone of sixty carats will fetch a sum of from £20 to £35. Pink coloured topazes are extremely rare in nature, but they are easily artificially made from the yellow, by exposure to a certain degree of heat. Red topazes are also extremely rare, but are beautiful gems of a fine crimson colour tinged with rich brown. They are generally taken for a variety of ruby. Blue topazes occur more frequently and of considerable size, occasionally occurring upwards of an ounce in weight. They are of a fine celestial blue colour, and when light coloured are often taken for aqua marinas. The Siberian or white topaz is a beautiful pellucid gem, and is known in Brazil by the name of "goutte d'eau." Topazes occur generally in primitive rocks, and in many parts of the world, as in Scotland, Cornwall, Saxony, Siberia, Brazil, &c. They are usually found in the form of crystals imbedded in crystallized rocks; but are found also in rolled masses in the middle of alluvial formations.

Torpedo. *The Electric Ray.* See RAIIDÆ.

Tortricidæ. *The Leaf-rolling Moths.*—A family of lepidopterous insects belonging to the section *Heterocera*, and composed of numerous species of small moths, the caterpillars of which are frequently the occasion of great injury to the vegetable world. They are generally dull coloured, and are distinguished by their broad entire fore wings, which form a triangle when the body is at rest. The larvæ are naked, fleshy grubs, the greater number living in cylindric tubes, which they form by rolling up leaves. Some find their home in various fruits. The codling moth, *Carcocapsa pomonella*, is one of the most destructive enemies to the apple crops in this country. *Tortrix viridana* feeds upon the oak, which, in certain years, it strips of its foli-

age; and *T. vitana* is the great pest of the vines in France. It attacks the leaves, rolling them up and fastening them together by threads. Some years this little pest does incalculable damage.

Totaninæ.—A sub-family of birds, of which the genus *Totanus* or gambet is the type. See SCOLOPACIDÆ.

Tourmaline.—A mineral substance occurring crystallized. The crystals vary in colour, and some of the varieties form precious stones of great beauty and value. They are either rhomboid or in prisms, with from three to twelve sides, and are generally found in primary rocks, especially granite, gneiss, and mica slate. Tourmaline is a boro-silicate of alumina, with an alkaline base. It is harder than quartz, but not so hard as topaz. Spec. grav. 3· to 3·076. It receives different names according to the colour. The red tourmaline is called *Rubellite*, and when transparent and free from cracks, is a gem of great value, possessing the richness of colour and lustre of the ruby. A specimen of this variety in the collection of the British Museum, from Siberia, is valued at £500. It is also found in Ceylon and in the kingdom of Ava. The yellow tourmaline occurs in Ceylon, and is but little inferior to the topaz, for which it is often sold. Black tourmaline is known by the name of *Aphrizite* or *Schorl*, and occurs in Devonshire, Spain, and other places. It is coloured black by oxide of iron. Crystals occur also of a green colour; and of a deep blue called *Indicolite*. Colourless or white tourmaline, *Achroite*, is found at St. Gothard. This variety becomes electric when heated, and on account of its great power in polarizing light, is largely employed in the manufacture of polarizing instruments.

Toxoceras (τοξον, a bow; κερας, a horn).—A fossil genus of cephalopodous *Mollusca*. See AMMONITIDÆ.

Toxodon (τοξον, a bow; ὀδους, a tooth).—A genus of extinct animals, the skull of which was found in South America, 120 miles from Monte Video. The species upon which the genus is founded has received the name of *T. platensis*. The cranium measures two feet four inches in length, is of an elongate, depressed form, and is chiefly remarkable for the strength and wide expanse of the zygomatic arches. It must have been an animal of large size, and appears to belong to the *Pachydermata*, though the form and structure of the teeth manifest a relation to the *Rodentia*. The two outer incisors are very large and curved, and it is from this structure that the generic name is derived.

Toxotes (τοξοτης, an archer). *The Archer-fish.*—See BRAMIDÆ.

Tracheæ. — In Zoology, *tracheæ* are the respiratory tubes of insects and spiders, and consist of cylindrical tubes, containing air. In Botany they are spiral vessels, which admit of being unrolled, but present the appearance of elongated tubes, resembling the tracheal tubes of insects.

Trachypterus.—A genus of fishes belonging to the ribbon-fishes. See TÆNIIDÆ.

Trachytella (τραχυτης, roughness). — A genus of dicotyledonous plants belonging to the nat. ord. *Dilleniaceæ*. There are only two species known, both natives of China and Cochin-China, and remarkable for the roughness of their leaves. Those of *T. Actæa* are employed in Canton for polishing both wood and metal.

Tradescantia.—A genus of plants named after *Tradescant*, a botanist. See COMMELYNACEÆ.

Tragelaphus.—A genus of antelopes. See STREPSICERÆ.

Tragopogon (τραγος, a goat; πωγων, a beard). *Goats' Beard.*—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Cichoreæ*. It is composed of herbs with linear, lanceolate leaves, yellow or violet flowers, disposed in terminal heads, and the seeds furnished with a long silky pappus or beard. Several species are natives of Great Britain and the temperate parts of Europe; but *T. porrifolium*, the leek-leaved goat's beard, is one of the most interesting. It is a native of the meadows of the south of Europe, but is now cultivated to a considerable extent under the name of salsify. The root is the part used. It becomes by cultivation fleshy and tender, and has a mild and sweetish flavour. It is prepared in the same way as scorzonera root, but is considered much more delicate.

Tragulus.—A genus of cervine animals. See MOSCHINA.

Trapa.—A genus of dicotyledonous plants belonging to the nat. ord. *Onagraceæ*. The species are found in the temperate parts of Europe and Siberia, in Cashmere, India, China, and Cochin-China. They are aquatic plants, floating on the surface of lakes and on that of slow running waters; and as the fruit is remarkable for the spines with which it is furnished, they often receive the name of water caltrops. *T. natans* is a European species, and the fruit has four spines. The nut being edible, and tasting like chestnut, the plant is often called water chestnut. *T. bispinosa*, known in India by the name of singara, has only two spines on its fruit, which are opposite, straight, and barbed. The nuts are much esteemed by the Hindoos, and are sold in all the bazaars throughout India.

Trematoda (τρημα, a hole).—A genus of intestinal worms. See ENTOZOA.

Tremella.—A genus of hymenomycetous *Fungi*, forming the type of the family *Tremellini*. The plants belonging to this genus are of a soft, gelatinous appearance, and look like gummy exudations upon branches and trunks of trees, on dead wood, &c. They have in former times been objects of vulgar dread and superstition, as may be understood by the common names they

receive, as witch guts, witch meat, and witches' butter.

Trepang. *The Sea-slug.*—See HOLOTHURIIDÆ.

Treron.—A genus of pigeons. See COLUMBIDÆ.

Trctosternon (τρητος, perforated; στερνον, sternum).—A fossil genus of shielded reptiles belonging to the order *Chelonia*, found in the purbeck limestone. The carapace of this genus is broad, flattened, and sculptured all over with small dots. It approaches the genus *Trionyx* in form; but as traces of the impression of scales similar to those of *Emys* have been observed, it must in reality rather belong to the family *Emydidæ*. It seems thus to form a transition from the *Trionycidæ* to the *Emydidæ*.

Triacanthus (τρια, three; ακανθα, a spine).—A genus of fishes. See BALISTIDÆ.

Trichechus. *The Walrus.*—See PHOCIDÆ.

Trichina (θριξ, a hair).—A genus of intestinal worms belonging to the class *Entozoa*, order *Nematoidea*, the species of which are found parasitical in the muscles of human subjects, and some of the lower animals. *T. spiralis*, the worm upon which the genus is founded, is very small, of a cylindrical form, narrowed towards the anterior end, obtuse and rounded posteriorly, and with a transversely striated or annulated integument. It is generally found spirally twisted upon itself, but when extended, measures in length about $\frac{1}{25}$th to $\frac{1}{30}$th of an inch, and about $\frac{1}{700}$th to $\frac{1}{800}$th of an inch in diameter. The muscles of the trunk are the parts where these little creatures are chiefly found, and they occur sometimes in very great numbers. They appear to be derived from the food, and can apparently be communicated from one animal to another. A dog, for instance, has been found to have its muscles infected with the worms after having been fed upon the flesh of a badger which was loaded with them. Some helminthologists consider the trichina to be only an immature form of some other species, not yet determined.

Trichocephalus (θριξ, a hair; κεφαλη, head).—A genus of intestinal worms belonging to the class *Entozoa*, order *Nematoidea*. It contains several species. *T. dispar* is the species commonly found in the intestines of man. This worm is very long, the anterior portion of the body being very fine, like a hair, containing only the mouth and œsophagus; the posterior thicker, and spirally twisted, containing the intestines and other organs. The large intestines, chiefly the cœcum, are the parts where they are principally found, and sometimes they are very abundant. This species was first observed in several individuals who had died of a disease called *morbus mucosus*, the typhoid fever of modern physicians, and was erroneously considered to be the cause of the disease. It is said to be the same species as that found in pigs. Monkeys, foxes, rodent animals, pigs, and marsupial animals, are all subject to the presence of distinct species of this curious genus.

Trichoda.—A genus of ciliated *Infusoria*. The animals belonging to the genus *Trichoda* have a soft, flexible body, of a variable form, and are distinguished by being furnished with cilia or strong hairs, which serve as objects of locomotion, and assist the animals in procuring food. They are possessed of a mouth, which in some is distinctly visible, and in others only indicated by a row of cilia, which are stronger there than in the other parts of the body. They are generally colourless, or merely derive what little colour they possess from the food which they swallow in the stagnant water or infusions in which they live. They present no trace of intestine, but show internally a number of the hollow vesicles considered by Ehrenberg as stomachs, some of which open externally to evacuate their contents. They propagate by spontaneous division, the body, for this purpose, dividing either transversely or longitudinally, and the separate portions becoming distinct and independent animals.

Trichodesmium (θριξ, a hair; δεσμη, boot).—A genus of cryptogamic plants. See THALLOGENÆ.

Trichodon.—A genus of acanthopterygious fishes belonging to the family *Percidæ*. *T. Stelleri*, the typical, if not only species, inhabits the most northern parts of the Pacific Ocean, being found both on the American and Kamtschatkadale coasts. The female deposits her roe in the sand, where they are fecundated by the male. These fishes are very abundant at Unalaschka, where they bury themselves in the sands at low water, and are dug up by the natives with their hands.

Trichoglossus (θριξ, a hair; γλωσσα, tongue).—A genus of parrots. See PSITTACIDÆ.

Trichoptera.—An order of insects containing the *Phryganeæ*, or caddice-worm flies. The species belonging to it are characterized by possessing four hairy membranous wings, the under ones folding longitudinally.

Trichosanthes (θριξ, a hair; ανθος, a flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Cucurbitaceæ*. The genus is composed of annual or biennial herbs, possessing cirrhi, by means of which they cling to, and creep upon other plants. They are natives of the tropical parts of Asia and America, and have alternate, entire, or palmate lobed leaves, and flowers with the corolla fringed with hairs; hence the generic name. About twenty-five species are known, amongst which one, a native of China, *T. anguina*, is remarkable for its oblong, cylindrical fruit, being terminated by a long beak, presenting very much the appearance of a serpent. These fruits, when half-ripe, are eaten like cucumbers. Another species, a native of India, *T. cucumerina*, has a fruit which is very bitter, and possesses purgative qualities. The natives of the

coast of Malabar use an extract of it as a stomachic, and value it highly.

Triclasite.—A mineral. See FAHLUNITE.

Tridacnidæ (*τρεις*, three; *δακνω*, to bite).—A family of molluscous animals belonging to the class *Conchifera*, composed of two genera, *Tridacna* and *Hippopus*. The genus *Tridacna* contains several species, the shells of which present rather a peculiar appearance. They are generally very thick, solid, and extremely hard, being calcified, until almost every trace of organic structure is obliterated. They are triangular in shape, inequilateral, and widely gaping at the anterior extremity. The ligament is external, and the hinge is provided with two compressed, unequal, interlocking teeth. The animals attach themselves to rocks, corals, &c., by means of a byssus, and they have the faculty also of forming holes in the surface of the substances to which they may be fixed. The species are marine, and natives of the Indian Ocean, the China seas, and the Pacific. The best known species, *T. gigas*, or giant clam shell, is a native of the Indian Ocean, and is the largest shell known. It is strongly ribbed externally, the ribs being large, and relieved by projecting scales. The shell is so large, that to remove it from the rocks to which it is attached, it is frequently necessary to cut the byssus with a hatchet. The valves, separated, are often used in churches, in Roman Catholic countries, as "benitiers," or vessels for holding holy water. A pair may be seen in the church of St. Sulpice in Paris. They weigh upwards of 500 lbs., are more than two feet across, and were presented to Francis I. by the Republic of Venice. The genus *Hippopus*, bear's-paw clam, or horse-hoof shell, differs from tridacna by the shell being closed in front. *H. maculatus* is a beautiful species, found on the reefs of the coral sea, and well known from being so much used in the ornamental arts, for inkstands, &c.

Trifolium (*tres*, three; *folium*, a leaf). *The Trefoil or Clover.*—An extensive genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The species are numerous, upwards of 150 having been described. They are all herbaceous, and are spread over the temperate parts of the whole globe. The leaves of by far the greater number are divided into three leaflets; hence the generic name. The flowers are disposed in dense heads or spikes, and are of a purple, white, or yellow colour. A good many are natives of Great Britain, and perhaps the most important of all the species belonging to the genus is the common red clover, *T. pratense*. This plant is abundant over all Europe, and is extensively cultivated for its excellent forage for horses and cattle. A variety of this species, *sativum*, is said to have been introduced to Britain by the Romans. *T. repens*, Dutch or white clover, is a very abundant species. It is one of those plants that grow in almost all soils and all situations, and being a perennial, is always sown where lands are intended for permanent pasture. It is a general belief that white clover will appear in abundance on any moor land, when the soil is turned up for the first time, and lime applied. It is said to be the shamrock of Ireland, and the leaves are worn by the Irish as the badge of their country. Many botanists, however, consider the true original shamrock to be the *Oxalis acetosella*.

Triglidæ. *The Gurnards.*—A family of acanthopterygious fishes, remarkable for their square-shaped head, which is covered with bony plates, resembling armour, and defended with large spinous processes. The body is covered with small, rough, cuspidate or prickly scales. They have two dorsal fins, and some have three or five free rays under the pectorals, which are often large, and in some species so much developed, as to enable them to leap out of the water, and sustain themselves a short time in the air. Their swimming bladder is large. The gurnards are remarkable for the peculiarity of their form and brilliancy of colours, and are well known for the grunting noise they make under the water, and even in the fishermen's nets. The species are rather numerous, and are met with in the seas of all climates. Several are British, amongst which the red gurnard, *Trigla pini*, of a bright rose-red colour; the gray gurnard, *T. Gurnhardus*, of a silvery-gray, more or less clouded with brown, and speckled with black; and the sapphirine gurnard, *T. hirundo*, the inner surface of the pectoral fins of which is of a vivid green and blue colour, are the most remarkable, and the most commonly met with in the market. They are much esteemed as an article of food. The flying gurnard is a native of the Mediterranean. See DACTYLOPTERUS.

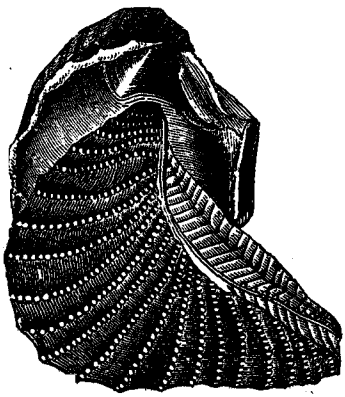
Trigona (*trigonos*, three-cornered).—A genus of shells. See VENERIDÆ.

Trigonella (*τρεις*, three; *γωνια*, an angle).—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The species of which this genus is composed are herbs, indigenous to the region of the Mediterranean and Central Asia. The leaves are stipulate and trifoliate, and the flowers generally disposed in a capitate umbel or in a bunch. There are upwards of thirty species described, only five of which are European. The best known species is the common fenugreek, *T. Fœnum-Græcum*. This plant is cultivated throughout Greece and the East as an article of food. The seeds are the part used, and they are eaten either boiled or raw, mixed with honey. Their scent is very strong; and hence, no doubt, they have been considered to possess medicinal virtues. *T. cærulea*, a native of Switzerland and Bohemia, is cultivated both as an ornamental plant and as a useful one. Its flowers are of a delicate blue colour, and possess a penetrating odour, like that of balsam of Peru. This odour increases by drying, and is employed by the

Italian perfumers to mix with various of their preparations. The Swiss also use it to give an aroma to some of their cheeses.

Trigonellites.—A genus of fossil cephalopods. See AMMONITIDÆ.

Trigonia (τριγωνος, triangular).—A genus of molluscous animals belonging to the class *Conchifera*, and forming the type of the family TRIGONIIDÆ. There are only three recent species described, all natives of Australia. The shell is of a triangular form, of considerable thickness,

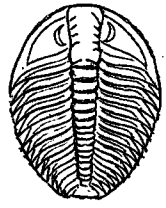


Trigonia caudata.

and tuberculated or ornamented with radiating or concentric ribs. The teeth are strong, two in the left and three in the right valve, and striated across. The interior of the shell is highly nacreous, and two of the species are brightly coloured. The fossil species are very numerous, about 100 having been described, and are most abundant in the oolitic rocks. The species appear for the most part to have attained much larger dimensions than the recent.

Trigonocephalus (τριγωνος, triangular; κεφαλη, head).—A genus of serpents. See CROTALIDÆ.

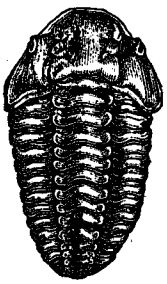
Trilobites (τρεις, three; λοβος, a lobe).—Extinct fossil animals belonging to the class *Crustacea*, and now generally arranged amongst the *Entomostraca*, constituting the tribe *Trilobitæ* or *Palæadæ*. They are the oldest articulated animals that we are acquainted with, and do not exactly correspond with any one group of living *articulata*, but appear to form a connecting link between the *Phyllopoda* and the *Pœcilopoda*. The body, as we see them in the fossil state, consists of a series of rings, varying in number, and is distinguished into three distinct parts—head, thorax, and abdomen. They have two large, compound eyes, which appear prominent. Some slight traces of the mouth have been seen in a few; but no antennæ have as yet been observed in any, nor have the feet been ascertained. These latter organs, therefore, must in all probability have been soft, membranous, and leaf-shaped, like those of the *Phyllopoda*, while the feelers were in all likelihood short and undeveloped Burmeister thus sums up our knowledge of these curious creatures when they were alive: — 1. They moved only by swimming, remained close beneath the surface of the water, and did not creep about at the bottom. 2. They swam in an inverted position, the belly upwards, the back downwards, and they made use of the power of rolling themselves into a ball as a defence against attacks from above. 3. They fed upon small aquatic animals, and, in the absence of such, on the spawn of allied species. 4. They most probably did not inhabit the open sea, but the vicinities of coasts, in shallow water, and lived gregariously in vast numbers, chiefly of one species. 5. The number of species could never have been very great, as scarcely more than six or eight have been found together in any one stratum. 6. The number of individuals, however, must have been very great. They underwent a progressive metamorphosis. 7. As the recent *Phyllopoda* present great differences in size in the same species, according to their age, so in the *Trilobites*, large individuals do not indicate a separate species, unless other differences are presented. There are no traces of trilobites exhibited in strata formed subsequently to the palæozoic period, and they were first observed in British rocks. They have been found widely distributed, for we find them in North and South America, in different parts of Europe, and in South Africa. They have been divided into three families, according to the nature of their shelly covering:—I. *Eurypteridæ*, which have no shell. Only one genus is known. See EURIPTERUS. II. *Cytherinidæ*, which have a bivalve, bean-shaped shell. Of this family also only one genus is known. See CYTHERINA. III. *Trilobitæ*, which have a shell consisting of as many rings as there are joints of the body. This last family contains many genera and species, and is divided into two large groups—1st, those which have the power of rolling themselves up into the form of a ball, as *Ogygia*; and, 2d,



Ogygia Buchii.

those which have not the power of rolling themselves up in the form of a ball, as *Calymene*. The species belonging to the first group are

chiefly found in the limestone formation, and are not of such ancient date as those of the second,



Calymene Blumenbachii.

which are principally found in the lowest silurian rocks.

Tringa. *The Sandpipers.*—A genus of birds. See SCOLOPACIDÆ.

Triocephali.—A family of monsters. See OTOCEPHALÆI.

Triodon (τρεις, three; ὀδους, tooth). —A genus of fishes. See DIODONTIDÆ.

Trionyx (τρεις, three; ονυξ, a claw).—A genus of turtles. See CHELONIA.

Tripe de Roche.—A species of lichen. See THALLOGENÆ.

Tripoli.—A mineral substance composed of silica, alumina, and oxide of iron, occurring in the form of a coarse, dull, earthy mass, which is rough, but does not adhere to the tongue. It is easily scratched by the nail, is difficult of fusion, but imbibes water, which softens it. Specific gravity 1·86 to 2·2. It appears to be composed of the shields of infusorial animalcules or diatomaceæ. It was first brought from Tripoli in Africa, but has since been found in France, Italy, and near Prague in Germany. Tripoli is employed in polishing metals, marble, glass, &c.

Tripoxylon.—A genus of wasps. See CRABRONIDÆ.

Triticum. *The Wheat.*—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ* or grasses. It is from this genus of plants that are derived the various kinds of wheat, which renders it one of the most important genera of plants that are known. As an article of food wheat takes a prominent place in the earliest records of man. The proximate vegetable principles which the flour of wheat contains are starch and gluten, the first containing a large quantity of carbon, the latter containing a larger proportion of nitrogen than any other cereal we possess. Foods that contain carbonaceous matter are fattening, whilst those which contain nitrogen are strengthening. It is thus that wheat flour has become to be the staple article of food of the finest races of men in the world. Wheat has been so long cultivated by man that almost all trace is lost of its native country. The common wheat, *T. vulgare*, which includes two varieties, *æstivum* and *hybernum* (raised to the rank of species by some botanists), has been found wild in some districts of Persia and Siberia, apparently removed from the influence of cultivation. It is cultivated to a great extent in Great Britain, France, Portugal, Spain, Italy, Greece, Germany, Hungary, the Crimea, and Caucasus; Persia, Northern India, Arabia, and Egypt. It can be reared, indeed, wherever the mean temperature of the year is not under 37° or 39° Fahrenheit, and the mean summer heat, for a period of at least three or four months, is above 55°. The genus *Triticum* contains about forty species, many of which, however, are merely grasses, and some very troublesome ones to the farmer.

Triton (*Triton*, a sea deity).—A genus of batrachian reptiles. See BATRACHIA.

Triton.—A genus of gasteropodous *Mollusca*, nearly allied to the family *Muricidæ*. The shells of this genus are furnished with a series of disconnected varices running up the spire at irregular distances. The species are numerous, nearly 100 recent, and upwards of forty fossil species having been described. They are distributed generally over the whole globe, and many reach a large size. *T. variegatum* is one of the most common, and is well known as the sea conch or trumpet of Triton. It is the conch used by the Australian and Polynesian islanders. The apex having a hole bored in it, notes can be produced by blowing through the aperture.

Tritonia.—A genus of nudibranchiate *Mollusca*, forming the type of a small family of these interesting little animals. There are a good many species known. See NUDIBRANCHIATA.

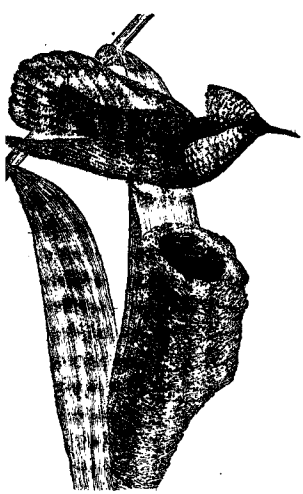
Trivia.—A genus of cowries, commonly called *Pigs*. See CYPRÆIDÆ.

Trochetia.—A genus of leeches. See ANNELIDÆ.

Trochidæ (τροχος, a hoop).—A family of molluscous animals belonging to the class *Gasteropoda*, composed of numerous species divided amongst several genera and sub-genera, but nearly corresponding to the genus *Trochus* of Linnæus. According to some conchologists, these shells form part of the family *Turbinidæ*, but they differ from them in having a more conical shell with a square mouth, and a horny, many-whirled operculum. They live on the rocks and sea-weeds near low water mark, and sometimes in the deeper parts of the seas.

Trochilidæ. *The Humming-Birds.*—A family of birds belonging to the tenuirostral tribe of the order *Passeres*. This family contains a great number of species, above 300 having been described, and they have been divided into many genera and sub-genera, in the last list amounting to no fewer than seventy-six! It contains some of the smallest known birds, and many remarkable for the wonderful splendour of their plumage. In this respect, indeed, neither pen nor pencil can

convey anything like an adequate idea of their dazzling lustre. They are active little birds, and the structure of their tiny frames shows that they are intended to pass the greater part of their life in the air. Their food consists of small insects, and, perhaps, the nectareous juices of flowers, and their tongue is exquisitely fashioned for enabling them to obtain this kind of food. It is very long, and can be darted out of the bill to a considerable length by a sudden motion like that of a spring. Their feet are small, generally dark coloured, and in several species which live high up in mountainous regions, have the tarsi warmly protected with large white plumelets, giving them the appearance of having downy muffs on their legs. Their wings are very long and narrow, and they are, by means of the rapid motion given to them, able to balance themselves in the air, hovering round flowering shrubs and plants, probing their tubular nectaries, and at the same time emitting a pretty loud humming noise—hence their English name. They are very pugnacious birds, and defend their nests with the greatest courage against all intruders, even man himself. Humming-birds are exclusively natives of the New World, and we were first made acquainted with them by the Spaniards who invaded Mexico. They are found from one extremity of the continent to another, though in greatest abundance in the tropical parts, in the deltas, and along the banks of the great rivers which flow through this vast country. They are also found inhabiting the West India Islands, and some species found there do not occur on the



Ornismya moschitis and nest.

id. One of these, *Mellisuga humilis*, has a very sweet note, and is perhaps the only species of the family that has a real song. The male of this bird is about 2½ inches in length, and is described as appearing, when darting diagonally upwards, exactly like a humble bee. The nests of the humming-birds are wonderfully made, and almost all the species lay two eggs, in some cases extraordinarily small. The genus *Trochilus*, to which they were originally all referred, contains now only comparatively few species. The typical species, *T. colubris*, the ruby-throated humming-bird, is a beautiful species, about 3½ inches in length, the body glittering with green and gold, and the throat and chin rivalling the ruby in brilliancy. The smallest species of all, and indeed the tiniest of the feathered race, *T. minimus* (*Mellisuga minima*), is only 1¼ inch in length, and weighs only about twenty grains. The species selected for representation is the *Ornismya moschitis*.

Trochiscus.—A genus of gasteropodous *Mollusca*, belonging to the family *Trochidæ*. The shell upon which this genus is founded resembles very closely a species of *Turbo*, but possesses a horny operculum.

Trochoceras.—A genus of fossil cephalopods. See NAUTILIDÆ.

Trochus.—A genus of shells belonging to and forming the type of the family *Trochidæ*. The shells of this genus are pyramidal, with nearly flat bases, and the mouth is depressed, obliquely triangular, smooth and pearly inside. The columella is always twisted, slightly truncate, and the operculum is horny, and many-whirled. The recent species are numerous, about 150 having been described, are distributed over most parts of the globe, and have recently been divided into a considerable number of sub-genera. The fossil species are still more numerous, and occur both in the older formations, and in the more recent tertiary deposits.

Troglodytes (τρωγλη, a hole; δυω, to creep). —The chimpanzee. See SIMIIDÆ.

Troglodytes. *The Wren.*—A genus of birds belonging to the tenuirostral tribe of the order *Passeres*, and family *Certhiidæ*. There is only one European species, our little familiar wren, *T. Europæus*. This well known bird, the Kitty wren, as it is commonly called, is a native of northern and central Europe, and extends to Smyrna and Trebisond. It is only about 3½ inches long, and of a peculiar round shape and short tail. Like the robin, this little bird courts the neighbourhood of man, and in winter takes refuge from the severe cold in cattle sheds, and other warm places. Its song is rather sweet and sprightly, and is continued throughout the whole winter. The nest of the wren is constructed with much art, is of an oval shape with a dome-like top, and the entrance is a small aperture at the side. The female lays from ten to sixteen, or even eighteen eggs. Insects and worms form their chief food. America possesses her wren also, *T. domestica*, which is as well known and equally familiar with them as our little favourite is with us. It is a

larger bird, however, than ours, and is said to have a finer and stronger note.

Trogonidæ. *The Trogons.*—A family of birds belonging to the fissirostral tribe of the order *Passeres*. Between thirty and forty species have been enumerated, the greater number of which are natives of America and its islands. Several are found in the large islands in the Indian Ocean, as Ceylon, Java, Sumatra, and Borneo, &c., while only one has as yet been found on the whole continent of Africa. The family is characterized by their having the bill short, triangular, and strong; the tips, and generally the margins, toothed; the wings very short, and their tarsi and feet weak. Like the rest of the tribe to which they belong, they have a wide gape, and are truly insectivorous. They are solitary birds, living in the deep and gloomy

Trogon resplendens—Resplendent Trogon.

recesses of the forest, far from the haunts of civilized man, and though not of strictly elegant forms, are remarkably brilliant in their plumage. Taking up their position in the centre of a thickly leaved tree, they remain there the whole day almost, lying in ambush for insects passing within their reach. They are most active in the morning and evening twilight. The most beautiful of all the species is the resplendent trogon, *T. (calurus) resplendens*, a native of Guatemala, in Mexico. It is a very beautiful bird, and, indeed, as has been well observed, it is scarcely possible for the imagination to conceive anything more rich and gorgeous than the golden-green colour which adorns the principal part of the plumage of this splendid bird; or more elegant and graceful than the flowing plumes which sweep pendent from the lower part of the back, forming a long train of metallic brilliancy. This bird was celebrated in the mythology of the ancient Mexicans; whilst the feathers of another species, also a native of Mexico, *T. curucui*, were employed by them in the fabrication of the figures and pictures used in festivals, in war, and in their temples.

Trogontherium.—A genus of beavers. See CASTOR.

Trombidiidæ.—A family of mites. See ACARIDÆ.

Tropæolum (τροπαιον, a buckler). *The Indian Cress.*—A genus of dicotyledonous plants forming the type of the nat. ord. *Tropæolaceæ*, and deriving their name from the leaf resembling a buckler in appearance. The species are herbaceous, trailing or twining plants, having a delicate texture, with alternate exstipulate leaves, and axillary, often gay flowers. They are natives of the temperate parts of America, and are extensively cultivated in Europe. *T. majus*, the great Indian cress or nasturtium, is a native of Peru, and was introduced into England in the year 1686. The unripe fruits of this and another species, also a native of Peru, *T. minus*, the small Indian cress, are used as a pickle, for which their warm biting flavour renders them very fit.

Trygon. *The Sting Ray.*—A genus of rays. See RAIIDÆ.

Tuber.—*The Truffle.* See THALLOGENÆ.

Tubicinella.—A genus of *Cirrhipedes*. See BALANIDÆ.

Tubicolæ.—A family of *Annelides*. See ANNELIDA.

Tubiporidæ.—A family of *Zoophytes*. See ANTHOZOA.

Tubularidæ.—A family of *Zoophytes*. See ANTHOZOA.

Tulipa. *The Tulip* (from a corruption of the Persian word *Thoulyban* or *Toleban*, signifying a turban).—A genus of monocotyledonous plants belonging to the nat. ord. LILIACEÆ, and forming the type of the sub-family *Tulipeæ*. The genus is composed of a considerable number of species, natives chiefly of Southern Europe and Central Asia. They have bulbous roots, radical leaves, oval, oblong, or lanceolate, and their stalk generally terminates in a single handsome flower consisting of a perianth of six sepals, campanulate in shape,

and caducous. Several of the species are indigenous to France and other parts of the continent of Europe; amongst which the wild tulip, *T. sylvestris*, found wild also in Great Britain, is perhaps the most abundant. The flower slightly pendent at the extremity of the stalk, is of a uniform yellow colour. *T. Gesneriana* is, however, the species which is so well known as the tulip of our gardens. It is a native of the Levant, but is now found growing wild in the environs of Nice, Calabria, and the Caucasus. The culture of this fine plant forms a remarkable feature in horticulture. No other plant almost sports by cultivation into so many varieties as the tulip. Horticulturists arrange the numerous kinds into two classes—those which have the colour detached upon a white ground, and those which have the ground more or less coloured. The first kind is most esteemed by amateurs, and are what are called Dutch tulips. In Holland the cultivation of tulips has long been a favourite amusement, and about two centuries ago became a perfect mania. It began about the year 1634, and like a violent epidemic, seized upon all classes of the community, leading to disasters and misery such as the records of commerce or of bankruptcies can scarcely parallel. The passion for the possession of those plants became in a short time so strong that dealing in them became one of the most important money speculations. In 1636 tulip marts had been established in Amsterdam, Rotterdam, Haarlem, Leyden, and various other towns, where tulip bulbs were sold and resold in the same manner as stocks are on the Stock Exchange of London. The eagerness with which men embarked in these wild speculations may be best explained by a statement of simple facts. Property to the value of 100,000 florins (florin equal to two shillings) was invested in the purchase of a few roots. One kind of tulip, the *Admiral Leifken*, was reckoned worth 4,400 florins. A *Semper Augustus* was deemed cheap if purchased for 5,500 florins. At one period there were only two roots of that rare species in Holland, and so intense was the passion to possess them that a merchant offered twelve acres of building lots for one of them which was at Haarlem, while its neighbour of Amsterdam was purchased for 4,600 florins, a carriage, a span of gray horses, and a complete suit of harness. A single root of the *Viceroy* was sold for the following articles:—two lasts of wheat, and four of rye; four fat oxen, eight fat swine, and twelve fat sheep; two hogsheads of wine, and four tuns of beer; two tons of butter, one thousand pounds of cheese, a complete bed, a suit of clothes, and a silver drinking cup, valued in all at 2,560 florins. This *tulipomania*, as it was called, was confined to the Netherlands, and rose to its greatest height in the years 1634, 1635, 1636, and 1637.

Tungsten.—A metal which derives its name from the two Swedish words *tung-sten* or ponderous stone. It was discovered by Scheele in 1781, and from this circumstance has also been called Scheelite or Scheelium. It occurs native in the form of tungstate of lime; and is found also in combination with lead, as tungstate of lead, and with iron, constituting the mineral known by the name of wolfram.

Tunicata (*tunicatus*, enveloped in a coat or tunic). *Tunicaries.*—A class of acephalous *Mollusca*, composed of animals which are extremely unlike shell-fish in appearance, and till lately were denied a place in works on conchology. They have no shells, but are protected instead by an elastic, leathery-looking tunic. They have no organs of locomotion, but are found floating freely in the sea, or fixed to rocks, stones, corals, seaweeds, and such like marine bodies. They are hollow, and have two orifices from which they squirt water with considerable force. The colour of these animals is very varied, sometimes even splendid, and are curious objects when seen fresh from the sea. When dried, however, they are exceedingly uninteresting, and present therefore little attraction for the collector. They are very apathetic and inactive, living upon minute seaweeds and diatomaceæ, which they draw into their mouth by currents of water caused by the action of their ciliated respiratory organs. A curious fact was lately discovered with regard to the external tunic of these animals. At one time it was believed that the substance called *cellulose* existed only in plants, and that its presence was a distinctive mark of the vegetable kingdom. This substance, however, is now found to be contained in the coat of the *Tunicata*. They are found in all seas, from low water to a considerable depth. The sexes are united in almost the entire class, and the young produced from eggs undergo a metamorphosis. The larvæ are shaped like the tadpole of the frog; the body is oval and furnished with black eye specks, short tentacular processes, and a long tail, by the vibrations of which they swim. Ultimately they fix themselves, the tail is absorbed, and the young tunicary is developed. In addition to reproduction by eggs, the tunicaries appear to possess the power of reproduction by buds, or what is termed gemmation. There are two great groups of tunicaries: those which are *fixed* in their adult state and those which *swim freely* in the open sea. The first or fixed group consists of three families—the solitary, social, and compound tunicaries or ascidians; and the free group consists of two—the pyrosomas and the salpæ. The simple or solitary ascidians, *Ascidiidæ*, are solitary or gregarious; oviparous; sexes united; branchial sac simple, or disposed in deep and regular folds. They were well known to Aristotle, and described at some length in his *History of Animals*. Many of the species are esteemed as articles of food in Brazil, China, and the Mediterranean. At Cette they are taken regularly to market, and one species, *Cynthia microcosmus*, furnishes a delicate morsel much sought after. They vary in length

from one inch to five or six inches, and range from low water to twenty fathoms, attached to rocks, shells, and sea-weed. The surface of *Ascidium echinatum* is studded with conical papillæ, each with four to seven radiating bristles. *Molgula arenosa* is of a globular form, is found in the muddy lochs and bays of the west of Scotland, and comes up in the dredge like a little ball of sand. The social ascidians, *Clavellinidæ*, are compound fixed animals, the individuals connected by creeping tubular prolongations of the common tunic, through which the blood circulates, or by a common gelatinous base. The individuals are small, some microscopic, and are found on stones, shells, and sea-weed, adhering by numerous root-like projections of the outer tunic. They are transparent and colourless, the stomach being indicated by an orange-coloured spot. Reproduction is effected by ova and buds. See CLAVELLINIDÆ. The compound ascidians, *Botryllidæ*, are fixed, their tests fused, forming a common mass in which they are imbedded in one or more groups; individuals not connected by any internal union. They are both oviparous and gemmiparous. The species are tolerably numerous, and are found either fixed on rocks, shells, &c., or encrusting marine substances. See BOTRYLLIDÆ. The pyrosomas are compound, free, and pelagic. They are often gregarious in vast numbers, and are splendidly phosphorescent at night. See PYROSOMA. The family *Salpidæ* consists of free animals found floating in the ocean. The sexes are combined, and the young are produced by gemmation in chains, which are unlike the parents, but become oviparous, and produce another generation like the parent. See SALPA, and ALTERNATION OF GENERATION.

Tupaia (Malay word, *Tupai*).—A genus of animals belonging to the class *Mammalia*, order *Feræ*, and family *Talpidæ*. The body of the animals belonging to this genus is elongate, cylindrical, and covered with close fur and short hairs. The tail is longer than the body, and is linear, compressed, and fringed on the sides. The snout is long and attenuated, the eyes large and prominent, the ears large and oblong, and the feet, unlike the typical species of the family, are formed for walking. The best known species is the banxring, *T. Javanica*. It is a native of Java. It lives on trees, and in habits, agility, and manner of life, resembles very much the squirrel. Two or three other species are known.

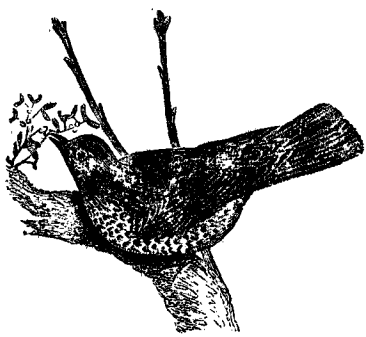
Turbinella (diminutive of *turbo*, a top).—A genus of molluscous animals belonging to the class *Gasteropoda*, and forming the type of a family, *Turbinellidæ*. There are a considerable number of species known, the shells of which are characterized by being thick, with a short spire, of a fusiform shape, and the columella marked with several distinct transverse folds. They are found in the seas of warm climates, and occur in both Old and New Worlds. *T. pyrum* is one of the largest and most remarkable species. It is a native of India, and is known by the name of the chank shell. In the temples on the Coromandel coast and in Ceylon, carved specimens are employed by the priests to hold sacred oil, and the reversed varieties are used for administering medicine, and are held sacred. The egg cases are large, numerous capsules being united together in a long somewhat spiral band. These are worn by the women of India as bracelets.

Turbinidæ. *Top Shells.*—A family of molluscous animals belonging to the class *Gasteropoda*, composed of numerous species, which, though varying a good deal in form, are generally rounded, more or less spiral or top-shaped, of a fine nacreous lustre internally, and always provided with a hard calcareous operculum of few whirls. Many of the species are handsome and elegantly coloured, and the greater number are natives of the seas of warm climates. When the epidermis and outer layer of shell are removed, they have a brilliant pearly appearance, and in this state some of them are used for ornamental purposes. The shell of *Turbo imperialis* is used in inlaid work as mother-of-pearl, and it is known in commerce by the name of the snail mother-of-pearl. The operculum of these shells varies considerably in appearance, and affords characters for dividing them into several genera. That of one species, *Turbo Sarmaticus*, has its external surface of a botryoidal appearance, resembling some of the tufaceous deposits of petrifying wells. This now forms the type of the genus *Sarmaticus*. The genus *Turbo* is the type of the family. The species are solid, turbinated shells, with a large round mouth, and the operculum is convex externally, and smooth. The genus *Imperator* is composed of top-shaped shells, with an oblong or four-sided mouth, very much resembling, and often confounded with *Trochus*, but readily distinguished by their oval, flattened, shelly operculum. The genus *Phasianella* consists of shells of an oblong ovate form, polished externally, marked with brilliant colours, and having an ovate mouth, but not pearly. The operculum is ear-shaped, flattened, and calcareous. The recent species belonging to the family *Turbinidæ* are numerous, nearly 100 having been described; but the fossil species far exceed them in number, about 430 having been enumerated.

Turbo (*turbo*, a whipping-top). See TURBINIDÆ.

Turdidæ or Merulidæ. *The Thrushes.*—A family of birds belonging to the tenuirostral tribe of the order *Passeres*, composed of many species characterized by having a strong bill with the sides more or less compressed, the culmen carinated, straight or curved to the tip, which in some cases is considerably bent over. The gape is sometimes bristled, the tarsi and toes strong, hind claw rather long, and the wings moderate, generally rounded. They inhabit the world generally, species of the family being found in almost every part of the globe. The family has

been divided into several sub-families. The ant-thrushes, *Formicarinæ*, have the bill lengthened, straight, with the tip suddenly bent downwards. Their wings are short, their tail generally short and even, and their tarsi lengthened and slender. They inhabit the tropical parts of the world, some seeking humid forests, and others the margins of streams. Their food consists chiefly of ants and other insects. The king of the ant-thrushes, *Grallaria* (*Turdus*) *rex*, is about the largest of this family, stands higher upon its legs than any other species, but has a very short tail. From the length of its legs, it might be taken at first sight for a wading bird. It is about the size of a quail, and its grey plumage is elegantly barred across. It lives more isolated than most of the others. For other species of ant-thrushes, see PITTA. The water-ouzel has also been referred to this sub-family. See HYDROBATA. The true thrushes, *Turdinæ*, have the bill lengthened, compressed, with the culmen gradually curved to the tip, which is dentate. Their wings have the third and fourth quills longest. The species are found in most parts of the world, are generally solitary in their habits, and feed for the most part on fruits, worms, and snails, &c. Some of them are remarkable for their song, and others for their power of imitating almost any sound. Of the first set there are several well known species, natives of Great Britain, and general favourites. The song-thrush, throstle, or mavis, *Turdus musicus*, exceeds all the others in vocal powers. From early spring, throughout the summer months, even until the autumn, this charming songster may be heard. It generally takes its station on the top of a lofty bush, or even a high tree, and there pours forth its notes in the morning and towards the close of day.



Turdus viscivorus—The Missel-Thrush.

The song-thrush inhabits every country in Europe, and has even been seen in winter at Smyrna and Trebisond. It was one of the birds that the Roman epicures used in their extravagant olios of brains and tongues of singing birds, and it is even now much relished by Italian gourmands. The missel-thrush, *Turdus viscivorus*, is about the largest of the British species, being about eleven inches in length, and is of a brown colour. He is an early songster, for, perched on the top of the yet leafless tree, he pours forth his loud and oft-repeated strain of melancholy but musical cadences, amid all the rudeness and chilling blasts of February. The advent of the storm is hailed by him in notes of more than ordinary power; and so remarkable is this habit, that it has obtained for this bird, in many counties, the name of the storm-cock. He is a bold bird, and will hardly suffer any animal to approach its haunts during the season of incubation, driving it from the spot with loud cries; hence the Welsh call him pen-y-llwyn, the head or master of the grove. In addition to the general fare of the thrushes, the missel-thrush is remarkably fond of the berries of the mistletoe—hence its English and Latin names. The blackbird, *Turdus Merula* (= *Merula vulgaris*), is another well known British songster, and for power and quality of tone is first-rate. His clear, mellow, fluting pipe, is first heard in the early spring, and is continued far into the year till the time of moulting. The blackbird is about ten inches long, the male is of a deep black colour, and the female is of a dark russet-brown. It is a solitary bird, restless and timorous, easily alarmed, and difficult of access. As a species it is widely diffused, occurring as far east as the Morea, and as far west as the Azores. The fruit consumed by the blackbird and thrush is well repaid by the good they do in destroying slugs and snails. These birds may be easily taught to imitate the human voice, to whistle tunes, and may be made to crow like a cock, and cackle like a hen. But the most remarkable of the species which are distinguished for possessing this faculty is the mocking-bird, *Turdus* (*Mimus*) *polyglottus*. See MIMUS. The babbling-thrushes, *Timalinæ*, have the bill straight and compressed, with the tip slightly emarginate. Their wings are short and rounded, their tail broad and graduated; their legs elevated, and their toes strong, armed with slightly curved claws. The species inhabit the warmer parts of the world, and are found on the mountains in the neighbourhood of rivulets. Most of the species congregate and make a chattering noise. They feed on insects and grains. The genus *Timalia* is the type of the family, and the species upon which it is founded, *T. pileata*, is a small bird about 6½ inches in length, and a native of Java. It frequents groves and small woods, builds its nest in hedges, and is a bird of social habits, delighting to dwell in the neighbourhood of plantations and human dwellings. It is generally a welcome neighbour wherever it resides, in consequence of the peculiarity and pleasantness of its note, which is remarkably slow and regular. The genus *Cinclosoma* is composed of two or three species found in Australia. *C. punctatum* is known by the name of

the ground-thrush, and inhabits Van Diemen's Land and Eastern Australia. It is found chiefly on the summits of low stony hills, and rocky gullies, particularly those covered with scrubs and bushes. Its flight is limited, but it runs fast, and when flushed rises with a sudden whirr like the partridge. Its note consists of a low piping whistle. As its English name imports, its habits are for the most part terrestrial, and its flesh is considered excellent eating. It is sold in the market of Hobart Town under the name of ground-dove. The orioles, *Oriolinæ*, another sub-family, have the bill lengthened, with the base broad and gradually compressed towards the tip; the nostrils naked, and the aperture large. Their wings are lengthened and pointed, and their tarsi rather short. The species are found in the warmer parts of the world, and are generally seen in small flocks near forests, where they feed on caterpillars, insects, and fruit. The genus *Oriolus*, however, contains one species which is a native of the temperate as well as the warmer parts of Europe, and is an occasional summer visitor to Britain. This bird, well known as the golden oriole, *O. galbula*, is about the size of the blackbird, and is of a fine bright golden-yellow colour, except the wings and tail, which are black tipped with yellow. It is a migratory bird, spending the winter in Asia and Africa, and passing the summer in Europe. In general it is to be found haunting lonely groves and thickets on the skirts of woods, but in the fruit season it comes to the neighbourhood of human habitations, to orchards, and gardens. The whistle of the oriole is loud but flute-like. The female builds her nest in the fork of a branch in a tree, and she is said to be so fond of her eggs and young, that she will suffer herself to be taken rather than abandon them. The last sub-family of the *Turdidæ* is the short-legged thrushes, *Pycnotinæ*. The species are remarkable for the shortness of their tarsi, which is the same length as the hind toe. Their bills are distinctly emarginate, and generally furnished with bristles, and their wings are for the most part short. These birds are peculiar to Asia and Africa, and are usually found in the woods, feeding on caterpillars, insects, and fruits.

Turdus. *The Thrush* and *Blackbird*, &c. See TURDIDÆ.

Turquoise.—A precious stone, well known for its beautiful celestial-blue colour, sometimes tinged with green. It is destitute of lustre, opaque, and does not admit of a very high polish. It is harder than glass, but softer than quartz. Spec. grav. 2·6296 to 3·25. The composition of turquoise is alumina, phosphoric acid, oxide of copper, oxide of iron, water, and carbonate of lime. The turquoise is much worn in necklaces, rings, and in every part of ornamental jewellery. The real turquoises are found exclusively in Persia, the mines from which they are obtained being situated near Nishapore. These mines are the property of the Crown, and bring a rent of from £2,000 to £2,700 a-year. A variety called occidental or bony turquoise, or *Odontolithe*, is found near St. Simon in Languedoc in France, and in Switzerland, but is found to be merely fossil bone coloured, and penetrated with phosphate of iron.

Turrilites (*turris*, a tower; λίθος, a stone).—A fossil genus of cephalopodous *Mollusca*. See AMMONITIDÆ.

Turritella (diminutive of *turris*, a tower).—A genus of gasteropodous *Mollusca*, forming the type of a small family, *Turritellidæ*, characterized by the species being turrited, elongate, many-whirled, spirally striated, and having a round mouth, and a horny operculum of many whirls. The recent species are found in almost all parts of the world, ranging from the laminarian zone to 100 fathoms. About fifty recent species have been described, and as many as 170 fossil.

Turtur. *The Turtle Dove.*—A genus of pigeons. See COLUMBIDÆ.

Tussilago (*tussis*, a cough).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*. Two species are natives of Great Britain, one of which, *T. Farfara*, is known by the name of colt's-foot, and affords a popular remedy for coughs and colds.

Tutenag.—A metal. See COPPER.

Typha (τύφος, a marsh). *The Reed Mace.*—A genus of monocotyledonous plants. See ARACEÆ.

Typhlops (τυφλωψ, blind). *Blind Lizards.*—A genus of reptiles belonging to the order *Saura*, and forming the type of the family *Typhlopsidæ*. The species are of small size, and have a cylindrical body, covered with uniform, polished, imbricated, six-sided scales. The head is broad and depressed, the nostrils lateral, the tongue elongate, flat, forked, and the mouth small. The intermaxillary and nasal bones, and the vomer, &c., are so solidly fixed to each other, that they cannot open their mouth wide. The eye is very small, nearly rudimentary, like a point, and hardly visible through the skin, and they have no external auditory orifice. They have no incisive teeth, and maxillary teeth in one jaw only; in some in the upper, in others in the lower. They are harmless creatures, live in moist places, or under stones, and, like the earth worms, dig for themselves small holes in the ground. They live upon insects, larvæ, small worms, &c., and are rather sluggish in their habits. About twenty-four species have been described, some about the size of the blind worm, and others not thicker than a crow quill.

Tyranninæ, Tyrannus. *The Tyrant Shrikes.*—A sub-family and genus of birds belonging to the fly-catchers. See MUSCICAPIDÆ.

Uaranus.—A synonym of VARENUS.

Udora.—A synonym of *Anacharis*—the plant which has been described under this name, *Anacharis Alsinastrum*, being now determined to be identical with *Udora Canadensis*, a native of America. It is believed to have been introduced into this country along with timber from Canada. See ANACHARIS.

Ulex. *The Furze* or *Whin.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The species are branched, evergreen shrubs, furnished with spines, and bearing yellow flowers, succeeded by a pubescent legume. The furze, gorse, or whin, *U. europæus*, is an exceedingly common plant in Great Britain. It is an erect, evergreen shrub, with beautiful yellow flowers, which appear in greatest abundance from February to May, though in mild seasons it may be seen in blossom all the year round; hence it has been called "the never bloomless furze." On the moors in the northern parts of Britain the whin is of great value, as a shelter to sheep in winter. Upon hilly and exposed cultivated grounds, near the sea, it is sometimes sown in ridges to form hedges. In years of scarcity, whins, bruised with the flail, have been used as winter food for horses. The flowers give out a yellow colour, and are used by children to dye their "paste eggs" in Easter. In Scotland at one time the whin was a principal article of fuel.

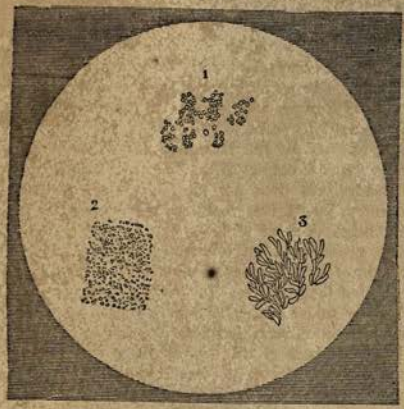
Ullucus (*ulluco*, one of the native names for one of the species).—A genus of dicotyledonous plants belonging to the nat. ord. *Portulacaceæ*. The species have tuberous roots, and there is one, a native of Peru and Bolivia, *U. tuberosus*, which is cultivated in these countries for the sake of the tubers, as an article of food. It is called by the natives, ulluco, olluco, and melloco. Growing in the mountainous regions of South America, where the climate is rather cold, this plant was considered fit to be introduced into Europe. Several attempts have accordingly been made, in consequence of the disease in the potatoes, to make it a substitute for this useful vegetable. It was found to succeed well in France, but, unfortunately, the tubers do not keep well.

Ulmaceæ. *The Elm family.*—A sub-order of dicotyledonous plants belonging to the large and important nat. ord. *Urticaceæ*. The species are rough-leaved trees and shrubs, with a watery juice, natives of the northern and mountainous parts of Europe, Asia, and America. By some botanists they form a distinct order by themselves. The typical genus, *Ulmus*, and the one which gives its name to the family, is composed of trees, many of which are useful for their timber, and others for ornamental purposes. About twenty species have been enumerated, natives of Europe, North America, India, and China. The English, or small-leaved elm, *U. campestris*, notwithstanding its name, is a doubtful native of Great Britain. It is indigenous to the middle and south of Europe, west of Asia and Barbary, and is asserted by some to have been introduced to this country by the Romans; or, as others believe, was brought from Palestine during the crusades. It does not ripen its seeds in this country, but thrives well, and more especially in the neighbourhood of large towns, such as London, grows to a large size. It often attains a height of from seventy to ninety feet, with a diameter of four or five. Its wood is compact and durable under water, and it has been used for sleepers on railways, and for wooden pavement. The inner bark of this tree is bitter, mucilaginous, and astringent, and has been used in medicine. The wych, or Scotch elm, *U. montana*, is a true native tree, and is found growing indigenous in many parts of Great Britain. Fine examples are to be seen in the south of Scotland; and one of the largest wych elms on record was the well known "trysting tree," near Kelso, the remains of which are still preserved, though the tree itself is apparently dead. In 1796 the trunk was thirty feet in girth. When old, the trunk often becomes sculptured with deep ridges, like a cork tree. A variety of *U. campestris* is equally remarkable for the corky nature of its bark, and has been described as a distinct species, under the name of *U. suberosa*, the cork-barked elm. Several species of American elms grow to the height of noble trees. *U. Americanus*, the American elm, is found in low woods, from New England to the Carolinas, and attains a height of from eighty to 100 feet.

Ulvaceæ.—A tribe of acotyledonous plants belonging to the nat. ord. *Algæ*, and family *Confervoideæ*. The species are amongst the simple forms of vegetable life, not being widely separated from the *Palmellaceæ*, though the conjunction of the cells into a definite membrane indicates a higher organization. The laver, *Ulva*, is a very common marine plant, and is eaten in the same manner as the dulse.

Ulvina.—A genus of acotyledonous plants. A species of this genus, *U. aceti*, is known as the vinegar plant, mother of vinegar. It consists of a compact, lubricous layer of very minute granules, at first membranaceous, then forming a compact stratum, vertically divided into dichotomous branches, loosely aggregated. It begins its growth as a thin pellicle, which is seen under the microscope to consist of small globules. This pellicle gradually becomes thicker, more compact and coherent, and in fourteen days it begins to grow on the exterior border. It then presents the aspect of a *Chætophora*, with a gelatinous

and fucoid appearance. When this substance is immersed in a solution of sugar or treacle, it soon converts the liquid into vinegar.



Ulvina acetis 1st, 2d, and 3d stages.

Umbelliferæ (*umbella*, an umbel; *fero*, to carry). *The Umbelliferous family of Plants.*—A nat. ord. of dicotyledonous plants, composed of numerous species, which are all herbs, and distinguished by having their flowers involucrate, and always in an umbel, and possessing five stamens and two pistils. They have often hollow and furrowed stems, with alternate, rarely opposite, variously divided, sheathing leaves, and are found chiefly in the northern parts of the northern hemisphere. About 267 genera and upwards of 1,500 species have been enumerated. They vary a good deal in their properties. Some are harmless, and are used as esculent vegetables—as, for instance, the celery—*Apium*; the carrot—see Daucus; the parsnip—Pastinaca; parsley—Petroselinum; angelica—Angelica, &c. Others produce a gum resin, often having a fetid odour, from the presence of a sulphur oil, and which are used as antispasmodics and stimulants—as assafœtida—see Ferula; gum ammoniac—see Dorema, &c. A third set yields a volatile oil, which renders them carminative and aromatic, as the anise *Pimpinella*; caraway seeds—see Carum; dill—Anethum; coriander—Coriandrum, &c. Whilst a fourth set are poisonous, in consequence of the presence of an acrid and narcotic juice, as the hemlock—see Conium; the water hemlock or cow-bane—Cicuta, &c.

Umbelliferous flower—The Carrot.

Umber.—A mineral or earth, composed of silica, iron, manganese, and water. It is soft, opaque, dull, meagre to the touch, adheres strongly to the tongue, and falls to pieces in water. Specific gravity, 2·206. Umber is employed as a brown pigment.

Umbo.—A term used in Conchology to mean, in bivalve shells, the prominent part which turns over the hinge.

Umbrella.—A genus of gasteropodous *Mollusca*, so called from a fanciful resemblance of the shell to an umbrella. The animal has a very large tuberculated foot, deeply notched in front, and the shell is like a very depressed limpet, and merely covers the important organs. The species upon which the genus is founded, *U. umbellata*, is a native of the Indian Ocean, and is generally known by the name of the Chinese umbrella shell.

Umbrina.—A genus of acanthopterygious fishes belonging to the family *Sciænidæ*. The species upon which the genus is founded is remarkably beautiful, the ground colour being golden, with bright bands of steel-blue. It is common in the Mediterranean, and though not a long fish, often weighs forty pounds weight. It is an occasional visitant to the shores of Great Britain, and its flesh is highly esteemed.

Uncaria.—The genus from which the substance called catechu is obtained. See Nauclea.

Ungulata. *The Hoofed Beasts.*—An order of animals belonging to the class *Mammalia*, characterized by having their feet formed for walking on the earth, their toes large, expanded at the end, and protected with hoofs, or large conical claws. To this order belong the families Bovidæ, Equidæ, Elephantidæ, Dasypidæ, and Bradypidæ; and it is equivalent to the *Pecora*, *Belluæ*, and *Bruta* of Linnæus.

Unio.—See Unionidæ.

Unionidæ. *River Mussels.*—A family of conchiferous *Mollusca*, containing a large number of species of shells exclusively inhabitants of fresh water, occurring in rivers, streams, ponds, and ditches. They are natives of all climates and all countries, though most particularly abundant in North America. They are covered with a hard, olive periostraca, under which the shell

appears hard and beautifully pearly, though very frequently the umbos are extensively eroded by the carbonic acid dissolved in the water they inhabit. In this family the sexes are distinct, the shells of the females being rather shorter and more ventricose than the males. In the winter and early spring the outer gills of the females are filled with spawn. The fry spins a delicate, ravelled byssus. The hinge of the shell presents several modifications, and the teeth form characters by which several of the genera are distinguished. The genus *Unio* is the most typical of these, and possesses two teeth in each valve. The shells are oval or elongated, smooth, corrugated or spiny, and become very solid with age. *Unio pictorum* may be taken as the type of the genus. It is a common shell in Britain and other parts of Europe, and derives its specific name from having been used for holding paints. The genus *Alasmodon* has only one tooth in each valve, the posterior tooth becoming obsolete with age. The pearl mussel, *A. margaritiferum*, is a well known species, a native of Great Britain, Lapland, and Canada. It is chiefly found in mountain streams, and is famed for frequently containing beautiful clear pearls, of considerable value. Several fisheries existed in this country at one time; and a pearl taken from an individual in the river Conway is said to be honoured with a place in the regal crown. The genus *Dipsas* is distinguished by having a linear tooth under the dorsal margin. The typical, and perhaps only species, *D. plicatus*, is the pearl mussel of China. This shell produces very fine pearls, and is taken advantage of by the Chinese for the production of artificial pearls, by the introduction of shot, pieces of wire, &c., under the mantle of the animal. Pearls of a fine water are thus produced; but being attached to the internal surface of the shell, are only good for setting. The genus *Anodon* is characterized by the hinge being edentulous, and the shell being smooth, rather thin, compressed when young, and becoming ventricose by age. Many of the species are large and handsome shells, *A. cygneum*, the swan mussel, being the largest of our fresh water shells. The species are numerous in America; and in one species, *A. undulatum*, a shell about three inches in length, the oviducts of a female specimen were found to contain about 600,000 young shells, perfectly formed. Of the family *Unionidæ* upwards of 300 recent species have been described, and upwards of fifty fossil, from the wealden, &c.

Unona.—A genus of dicotyledonous plants belonging to the nat. ord. *Anonaceæ*. The species are trees, or shrubs, or climbing plants, indigenous to the hot parts of the globe, as India, Africa, and South America. The bark and fruit of many of the species are aromatic, and rather acrid, and are employed as stimulating medicines or condiments. The seeds of *U. Æthiopica*, a native of Ethiopia and Sierra Leone, are known by the name of Ethiopian or negro pepper, and are employed by the negroes as a substitute for that condiment, on account of their aromatic and pungent taste.

Upupa.—See UPUPIDÆ.

Upupidæ. *The Hoopoe family.*—A family of birds belonging to the tenuirostral tribe of the order *Passeres*. The birds belonging to this family have an elongated, slender, curved beak, with the nostrils covered with feathers, directed forwards. The tarsi are strong, the claws strong and curved, and the wings are somewhat rounded. They have much the appearance and habit of crows, live on insects, which they seek for on the ground; also on fruits, and some on the honey of flowers. They are inhabitants of the warmer parts of the world, and some are singular for the form and beauty of their plumage. The genus *Upupa* may be taken as the type. In this genus the bill is very long and slender, and compressed. *U. epops*, the hoopoe, is remarkable for the arched crest of

Upupa epops—The Hoopoe.

feathers upon the head, which are of a ruddy-buff colour, terminated with black. The hoopoe is an autumnal visitant of the British isles; but is a native of most parts of Europe and the whole of North Africa. Its flesh in autumn is said to be well flavoured. It is an elegant bird, about the size of a thrush; and derives its name from its continually uttering, in soft and rapid tones, a peculiar sound, resembling "hoop, hoop, hoop." The genus *Epimachus* has a shorter bill, with the margins obtuse, and somewhat inflected; the tail is very long, and the side feathers of the body greatly developed. *E. magnus* is a splendid bird, of a black or brownish-black colour, with the feathers of the sides elongated, raised, curled, glittering on their edges with steel-blue, azure, and emerald-green, like precious stones. It inhabits the coasts of New Guinea.

Urania.—A genus of plants. See MUSACEA. Also a genus of insects belonging to the *Lepidoptera Heterocera*, containing five or six species which are almost peculiar to the island of Mada-

gascar. They have splendid colours, and all the appearance of a true butterfly, but their preparatory states and other circumstances have induced most naturalists to place them in the nocturnal section of the order. *Urania rhipheus*, or *prometheus*, is one of the handsomest insects of the section known. The superior wings are black, with a multitude of small transverse lines, and a large discoidal band of a brilliant golden-green, whilst the inferior wings are marked with two bands of green. The under surface of the inferior wings is green with black spots, and has a large brilliant, golden-red band traversing the centre.

Uranium.—A metal discovered in 1789 in pitchblende, and called after the planet Uranus, which was discovered in the same year. It is, when separated, of a black colour, with a metallic lustre, very combustible, and burning with a white light. The ore from which it is obtained, pitchblende, or protoxide of uranium, occurs in black compact masses, powder or granular. It is easily fractured, fracture conchoidal, uneven, lustre imperfect, metallic. Specific gravity 6·468 to 7·; hardness 3·5. It is found in the lead and silver mines of Bohemia and Saxony, and in Cornwall. Pitchblende consists of oxide of uranium, oxide of iron, silica, and sulphuret of lead. The different minerals containing *Uranium* are in general readily distinguishable by the colour they communicate to fluxes of glass. *Uranite* is a combination of uranium with phosphoric acid and lime, forming a calcareo-phosphate of uranium. The crystals are four-sided prisms, varying in colour from lemon-yellow to brown, transparent, translucent, and of an adamantine lustre. It occurs also in laminæ, and is found in veins in granite in several places in France and Saxony. *Chalcolite* is a combination of uranium with phosphoric acid and copper, forming a cupreo-phosphate of uranium. It occurs in scales of an emerald or grass-green colour, and is found in metalliferous veins traversing granite and mica schist, in the mines of Cornwall, and elsewhere. The oxide of uranium, and uranite of potash and ammonia, have been employed to colour glass. The colour imparted is an orange-yellow or greenish and opaline. The uranite of potash affords a splendid orange for artists.

Uranoscopidæ.—A family of acanthopterygious fishes, remarkable for the power they possess of raising their eyeballs out of their sockets and retracting them again within the level of the orbits. About fifty or sixty species belong to this family, most of them of an elongate form, and of rather a repulsive appearance, frequenting the bottom of the sea, and, like many ground fish, having organs of touch developed in form of barbels. They possess also a peculiar membranous filament under the tongue, which they can protrude at pleasure. The species are more numerous in the Australian seas than in any other quarter of the ocean. The ventral fins are composed of a spine and five jointed rays, situated in most of them, before the pectorals; the anus is generally before the middle of the fish, and the tail is often considerably longer than the body. They have no air bladder. The family is exemplified by the genera TRACHINUS and *Uranoscopus*. The Mediterranean species of *Uranoscopus*, *U. scaber*, called also by Pliny *Callionymus*, was well known to the ancients, and was described by Aristotle, and very correctly, as possessing a larger gall bladder than most other fishes. Dramatic authors referred to it proverbially when alluding to an angry man. The gall contained in it was supposed to possess great virtues. It was believed to have the power of rendering the sight more clear, of removing deafness, and depressing the fungous growths of old sores. The head of this fish is cubical shaped, and the eyes are placed on the flat summit, so that they look upwards. From this circumstance it is commonly called the star-gazer. The mouth is turned up in the same direction. It buries itself in the sand all but the summit of the head, and there lies in wait for its prey. None of the family are of any importance as articles of food.

Uranoscopus.—A genus of acanthopterygious fishes belonging formerly to the family *Percidæ*, but now forming the type of a small family, URANOSCOPIDÆ—which see.

Urceola.—A genus of dicotyledonous plants belonging to the nat. ord. *Apocynaceæ*, one of the species of which, *U. elastica*, yields a milky fluid which on exposure to the air separates into an elastic coagulum, possessing all the properties of caoutchouc.

Uredinei.—A family of minute coneomycetous *Fungi*, which show themselves as small, reddish, orange, or blackish rusty spots upon the leaves of various plants, and known by the name of rusts.

Uredo.—A genus of *Fungi*, family *Uredinei*. See THALLOGENÆ.

Uria.—A genus of guillemots. See ALCIDÆ.

Urodeles.—A group of reptiles. See BATRACHIA.

Uromastix.—A genus of saurian reptiles belonging to the family *Iguanidæ*.

Uropeltis.—A genus of serpents found in America.

Uroptera.—A group of minute amphipodous *Crustacea*, the species of which reside in the bodies of various acalephæ, and some other animals of the same kind.

Ursidæ. *The Bears.*—A family of animals belonging to the class *Mammalia*, order *Feræ*. The characters of this family are—body usually heavy, with or without a tail; limbs long and thick; plantigrade; claws strong; cartilage of nose elongated and moveable; lips generally very mobile, capable of extension; tongue long and extensible; carnivorous tooth bluntly tubercular, and not distinguishable from the other molars. Most of them have the power of climbing trees, and the structure of the teeth enables them to live

in part upon vegetable food. The species are rather numerous, and have been arranged in several sub-families, the true or typical bears, *Ursina*, the racoons, *Procyonina*, the pottos, *Cercoleptina*, and the pandas, *Ailurina*. The true bears, *Ursina*, have only one very large oblong tubercular grinder in the upper jaw, and their feet are very broad and short. The cylindrical bones of the bears, such as the thigh bone, for instance, approach nearer to those of man than the same bones in any other quadruped. The food of the bears consists of all manner of things. To a certain extent they are carnivorous, devouring flesh when pressed by hunger. They also eat fruits and legumes, and do not disdain crustaceans and insects. Honey they are particularly fond of, and the American bears will gnaw for a day together at the trunk of a tree in which honey is lodged, till they make a hole big enough to get in their paws, and then they haul out honey, bees and all. The greater number lay themselves up in caves or hollows for the winter, which they pass in a dormant state, and without food. The genus *Ursus* contains several species,

1. Polar Bear—*Thalarctos maritimus*. 2. Long-lipped Bear—*Melursus Lybius*. 3. American Black Bear—*Ursus Americanus*. 4. Malayan Bear—*Helarctos Malayanus*. 5. Common Brown Bear—*Ursus arctos*. 6. Grizzly Bear—*Damis ferox*.

natives of Europe and America. The brown bear, *U. arctos*, appears to have been the only species known certainly to Linnæus. It is widely diffused; it inhabits the mountainous districts of Europe from very high latitudes in the north, to the Alps and Pyrenees in the south. Siberia, Kamstchatka, and even Japan, it is said, to the eastward, possess this species, as well as a portion of the northern regions of America. To the Kamtschatkans the brown bear supplies the necessaries and even comforts of life. They clothe themselves from head to foot with the skin, make covers for their faces, and substitutes for glass for their windows with the intestines, while the flesh and fat serve them as food. The Laplanders hold it in great veneration, and call it the dog of God. This animal appears to have been at one time a native of the British isles, though it has long ago disappeared. Its usual size is about four feet in length and 2½ feet in height. The black bear, *U. Americanus*, is rather smaller, and appears to be confined to the continent of America, though now even there increasing civilization has driven it to the mountains and immense inland forests. The skin of the black bear used formerly to be in high estimation, and great numbers were annually imported to England. Their value has very much decreased of late, but they are still used for military purposes in this country, as for caps, pistol holsters, rugs, &c. In 1803, 25,000 skins were imported into England, but the number has diminished so much of late years that in 1851 it appeared only 9,500 had been imported, and of these 8,000 had been re-exported. The grizzly bear, *Damis ferox*, is a much larger species than the last, specimens having been measured nine feet in length, and weighing 800 lbs. It is an exceedingly powerful animal, and is capable of great rapidity of motion. The Rocky Mountains, and the plains to the eastward of them, are the chief haunts of the grizzly bear, though it is said they are found from 61°

north latitude to as far south as Mexico. It feeds sometimes upon fruits and roots, but at others preys upon other animals. The bison is said to be no match for this powerful creature. After killing it, it will drag the carcase to some retired place where it digs a pit for its reception, and returns to feed upon it till the supply is exhausted. Several species of bears, forming the genus *Helarctos*, are found in Asia, occurring in Syria, India, and the large islands belonging to it. The polar bear, *Thalarctos maritimus*, is an inhabitant on the other hand of the dreary regions which surround the north pole with eternal frost, and those coasts which are seldom free from ice. It is the most carnivorous of all the bears, preying upon animals of both land and sea, seals, and fishes, birds and their eggs, and feeding upon carrion, such as dead whales, as well as the flesh of animals they themseves have killed. The polar bear is of a more elongate form than any other species, is a large animal measuring from seven to 8½ feet in length, and weighing sometimes 1,600 lbs., and is very powerful. The fur is of a silvery-white tinged with yellow, close, short, and even on the head, neck, and upper part of the back; long, fine, and inclined to be woolly on the hinder parts, legs, and belly. The sole of the foot exhibits a beautiful instance of adaptation of means to an end, for it is almost entirely covered with long hair, affording the animal a firm footing on the ice. Remains of bears have been found fossil in great abundance in various parts of Europe. They occur in caves in England, and two species have been described, *Ursus spelæus* and *U. priscus*. The racoons, *Procyonina*, have the three last molars with blunt tubercles on their crowns. The nose is elongated and very mobile, ears small, tail very long and hairy. The feet have five toes, with sharp claws, and though the entire sole of the foot is applied to the ground when the animal is stationary, when walking the heel is raised. They have the peculiar habit of washing their food before eating it. The racoon, *Procyon lotor*, is a native of America, chiefly met with in the northern parts of the continent, but occasionally in the West Indies also. It is about two feet in length from the nose to the tail, the tail being ten inches more. The head is round, with a narrow tapering nose, rather large round eyes, and elliptical, erect ears. The colour is grayish-brown, with a dusky line running from the top of the head down the middle of the face, and ending below the eyes. The tail is thickly covered with hair, and is ringed with several black bars on a yellowish-white ground. The racoon is a savage animal n its wild state, and sanguinary, destroying great umbers of birds both wild and domesticated, nly eating the head, or drinking the blood which lows from the wounds. It is a good climber, nd the form of its claws enables it to adhere so rmly to the branch of a tree, that it requires no light exertion of strength to disengage it. It is nocturnal animal in a state of nature, but is tolerably easily domesticated, and then it appears to lose its nocturnal habits, and becomes active during the day and quiet at night. Its specific name, *lotor* (washer), is derived from its habit of plunging its dry food into water before eating it. The skin of the racoon is valuable, its fur being used in the manufacture of hats, and forms no inconsiderable article of commeree. The coati-mondi, *Nasua rufa*, bears considerable resemblance to the racoon, except that the neck and body are longer, the fur shorter, the eyes smaller, and above all, by the much greater elongation of its snout. It is a native of Brazil and the central parts of America, preys upon birds and small quadrupeds, but also eats eggs, and earth worms, for obtaining which, by rooting up the earth like the hog, its elongate snout is well adapted. It is about the size of a large cat, of a cinereous brown colour, and the tail ringed with circles of black. The potto is a species of *Cercoleptes*; for the panda, *see* AILURA.

Ursus. *The Bear.*—See URSIDÆ.

Urtica (*uro*, to burn). *The Nettle.*—See URTICACEÆ.

Urticaceæ. *The Nettle family.*—A nat. ord. of dicotyledonous plants, composed of many plants which vary much in appearance but which agree in essential characters. They are herbs, shrubs, and trees, a large proportion of them natives of hot climates, and in some instances yielding a milky juice. The leaves are alternate, stipulate, and usually scabrous or hispid, the hairs often furnished with a stinging secretion. The flowers are monœcious or dicœcious, scattered or collected

Stinging hair of *Urtica dioica*—the Common Nettle.

together into catkins or heads. The species belonging to this family are numerous, upwards of 600 having been described, and the genera amount to between sixty and seventy. Their properties

and appearance are various, and they have accordingly been divided into several sub-orders. The true nettles, *Urticeæ*, are rough-leaved plants, and the surface is generally covered with peculiar hairs, the bulbs of which are filled with an acrid juice producing a burning sensation when applied to the skin. The species are herbs or shrubs, are widely scattered over the globe, and many of them follow the footsteps of man in his migrations. The genus *Urtica* is the type of the family, and it is in some of the species of this genus that the structure of the stinging hairs is best exemplified. These hairs are glandular, with secreting cells at the base. They are formed of a single conical cell, dilated at its base, and closed at first at the apex, by a small globular button placed obliquely. This button breaks off on the slightest touch, when the sharp extremity of the hair enters the skin, and pours into the wound the irritating fluid which has been pressed out from the cells at the base. *Urtica dioica* and *urens* are the two most common species in this country, and are well known troublesome weeds. In spring the leaves of the former are used as pot-herbs boiled in broth. *U. pilulifera*, the Roman nettle, is not so common, but its sting is more virulent than the two others. The tree nettle, *U. gigantea*, a native of Australia, grows to a large size. Stems of this arboreal species have been measured from eighteen to twenty-one feet in circumference. Their sting is very severe, causing violent inflammation. The fibres of the nettles are very tenacious, and those of *U. tenacissima*, a native of Sumatra and Rungpore, are exceedingly strong, and are converted into powerful cordage. A species of linen cloth is manufactured from some of the other nettles, and the beautiful fabric called Chinese grass-cloth is the produce of an Indian plant belonging to this family. See BOEHMERIA. The other sub-orders or families into which the order *Urticaceæ* is divided, are CANNABINEÆ, the hemp tribe; ULMACEÆ, the elm tribe; MOREÆ, the mulberry tribe; and ARTOCARPEÆ, the bread fruit tribe.

Ustilaginei.—A family of minute coniomycetous *Fungi*, related to the *Uredinei*, and composed of a great many species, known under the names of *Bunt*, *Caries*, &c. The genus *Ustilago* is the type of the group, and contains a variety of minute parasitic plants which produce the disease called smut upon the ears of corn, such as oats, barley, &c., as well as on the leaves of grasses.

Uvella.—A genus of *Infusoria*. See MONAS.

V

Vaccinaceæ. *The Cranberry family.*—A nat. ord. of dicotyledonous plants, composed of small shrubs, occurring in temperate climates, but especially abounding in North America. Within the tropics they are found growing only on mountains. They have cylindrical or angular branches, simple, entire, dentate, or crenate leaves, somewhat coriaceous and persistent, and flowers solitary or grouped in bunches. The berries of several contain a quantity of mucilage, sugar, malic and citric acids, associated with a peculiar astringent principle, and are eaten either cooked or raw. From some of them a fermented liquor is obtained. The genus *Vaccinium* is the type of the family, and is composed of a considerable number of species, which are small shrubs, the greater part growing in North America, though several are found in the north of Europe, and in the north of Asia. Two or three are natives likewise of Great Britain. The most common species is the bilberry or blaeberry, *Vaccinium Myrtillus*, a small branchy shrub about a foot high, with angular branches, oval, sharp, and dentated leaves, small rosy-white flowers, and berries, when ripe, of a bluish-black colour, of the size of a pea. It grows abundantly in open woods throughout the greater part of Europe. The berries have a slightly acidulous and astringent flavour, and are very pleasant to the taste. They are often used in tarts, &c., and a syrup is made from them which some physicians on the continent recommend as useful in cases of dysentery. The flowers are much frequented by ants. Cranberries are the produce of *V. oxycoccus* and *macrocarpum*. See OXYCOCCUS. The black whortleberry, *V. uliginosum*, and the red whortleberry, *V. Vitis-Idæa*, are two other species which are abundant plants in North America, the north of Europe, and in the northern parts of England and Scotland. Preserved with sugar, the fruit is sometimes used as a substitute for the cranberry, while the leaves of the latter plant are occasionally used to adulterate *Uva-Ursi*.

Vaccinium.—See VACCINACEÆ.

Vahea.—A genus of plants. See APOCYNACEÆ.

Valeriana. *The Valerian.*—A genus of dicotyledonous plants belonging to the nat. ord. *Valerianaceæ*. The species of this genus are numerous, upwards of 125 having been described. They are herbs or under-shrubs, with opposite, exstipulate leaves, and are natives of temperate climates or elevated positions in both the Old and New World. The flowers are white, red, rosy-yellow, or even blue, and disposed in corymbs or panicles. The roots of many are strongly scented. The best known and most important species is the common or officinal valerian, *V. officinalis*, a large plant three feet and upwards in height, with smooth, erect, furrowed stems, and abundant in moist woods, and by sides of rivers and ditches in Great Britain and other parts of Europe. The leaves are pinnated, and the flowers are slightly rose coloured. The root of the valerian is a

powerful medicine. It has a strong, nauseous smell, and a bitter penetrating taste. It is chiefly as an antispasmodic that valerian root is used, and it is administered either in the form of powder or tincture. Its properties are due to the existence of a peculiar principle called valerianic acid. The powder is very attractive to cats, and also to rats, and is employed by rat-catchers to decoy rats. Several species are cultivated as ornamental plants in our gardens. *V. pyrenaïca*, for instance, is a handsome plant, with large heart-shaped leaves, and fine blue flowers.

Vallisneria.—A genus of monocotyledonous plants named after *Vallisneri*, an Italian botanist. See HYDROCHARIDACEÆ.

Vampirus. *The Vampire Bat.*—See CHEIROPTERA.

Vanadium.—A metal discovered in 1830 in the iron ore of Taberg, in Sweden, and named after *Vanadis*, a Scandinavian deity. It has since been found in the form of vanadiate of lead at Zimapan in Mexico, at Wanlockhead in Scotland, and in Wicklow, Ireland. Vanadium is a white metal resembling silver, or more strongly molybdenum. It is a good conductor of electricity.

Vanellus. *The Lapwing.*—A genus of birds. See CHARADRIIDÆ.

Vanessa.—A genus of insects belonging to the diurnal *Lepidoptera*, and family *Nymphalidæ*. The species are numerous, and are found in all parts of the world. In most of them the wings are angulated, the caterpillars have numerous bristly spines, and the pupa is much angulated and suspended by the tail. Many of these butterflies are very beautiful and richly coloured. They generally live near human habitations, and are found in gardens, public walks, open fields, &c.; their flight is rapid but short in continuance. Several of the species are well known

Vanessa pavonia.

British butterflies; as the Camberwell beauty, *V. Antiopa*, the peacock-butterfly, *V. Io*, the red admiral butterfly, *V. Atalanta*, &c. The species here represented is *V. pavonia*.

Vanga.—A genus of birds belonging to the dentirostral tribe of the order *Passeres*, family *Laniidæ*, and sub-family *Thamnophilinæ*, or bush shrikes. The species are distinguished by a large beak, very much compressed throughout, its tip strongly hooked, and that of the lower mandible bent downward. They are natives of South America, and are turbulent and peevish in their habits and manners. They attack other species of birds with great fierceness, and feed upon small living animals which they catch upon the borders of woods, &c.

Vanilla.—A genus of monocotyledonous plants belonging to the nat. ord. *Orchidaceæ*, the name of which is derived from the Spanish word "vaynilla," a knife or scissor-case, the fruit having the appearance of the sheath of a knife. From the capsules of one or more species is procured the substance called "vanilla," which is used to flavour chocolate, confectionery, &c. The Spaniards have three different kinds of vanilla which they distinguish in commerce, viz., the *pompona*, the *ley*, and the *simorana*. When the fruit begins to turn yellow, it is gathered and fermented in small heaps, and is then spread in the sun to dry, and when about half dried, pressed flat with the hand and rubbed over with the oil of palma christi; it is then exposed to the sun to dry, the oiling repeated, and the pods covered with the leaves of the Indian reed to preserve them. The fruit, which is brought to Europe, is of a dark brown colour, about six inches long, and scarce an inch broad, full of minute seeds of a pleasant smell, resembling balsam of Peru. See ORCHIDACEÆ.

Varanus or **Uaranus** (derived from the Arabic word *Ouaran*, the native name of the species in Egypt).—A genus of reptiles belonging to the order *Saura*, and family *Monitoridæ*. The species of this genus are large and strong reptiles, acquiring a size only inferior to the crocodiles. They are rather lanky in appearance, have an elongate head, a long and rounded neck, and a lengthened compressed tail, with a double-edged keel above. The skin is covered with enchased, tuberculous scales, and the tongue is protractile and fleshy. The species are aquatic, and have large, oblong, rather oblique nostrils placed in the centre between the apex of the muzzle and the orbits. The toes are elongate, unequal and strong. Several species are described from India, Borneo, and the Philippine Islands; two others, which are natives of Africa, forming now the genus *Regenia*.

Varech or **Varec.**—A name applied generally to sea-weeds on the coast of France. In the Channel Islands it is corrupted into *Vraick*. Sea-weed is collected by the inhabitants of Jersey and Guernsey twice a-year, in July and March.

It is very much used by the farmers as manure, but it forms also with the lower orders their chief fuel, instead of coal or wood. It makes a warm fire.

Variolaria.—A genus of acotyledonous plants belonging to the order *Lichenes*. The name is derived from the resemblance the apothecia have to the pustules of small-pox. The species are ashy-gray or whitish, and form upon trees, rocks, and walls, a spreading uniform, membranaceous crust. Several of these lichens have been found to contain oxalic acid. In a hundred parts of *V. fagínea*, a species found on old beech trees, twenty-nine parts were oxalic acid, and eighteen lime. At present, this lichen is extensively employed in France for the purpose of obtaining oxalic acid.

Vastres = Sudis = Arapaima.—A genus of abdominal malacopterygious fishes belonging to a family adopted by some ichthyologists, and named *Clupesocidæ*, from their being as it were placed between the natural families of pikes and herrings. The species of this genus are very interesting from the peculiarities of structure which they exhibit, their body being encased in strong, bony, compressed scales, forming a mosaic work extending over the vertical fins. The head is formed of deeply sculptured bones, with mucous cells, clothed in a thick skin. The mouth is pretty large, and the teeth rasp-shaped, and the air bladder is said to be cellular, like the lung of a fowl. There are about six species found in the rivers of South America, and they are remarkable for the size they attain, exceeding that of almost all other fresh water fishes. Their flesh is excellent as an article of food. *V.* (*Sudis* or *Arapaima*) *gigas* is found in the Rio Negro, and specimens are often taken which measure fifteen feet in length, and weigh four hundredweight. Sir R. Schomburgk describes the fishing for this species in that river. They are harpooned or taken with a baited hook, and are the objects of considerable fisheries. He tells us they fetch a high price, are excellent when fresh, especially the belly part, which is very fat, and when salted, they are exported in large quantities to Para, where they are preferred to the salted fish from the banks of Newfoundland. The natives use the os hyoides as a rasp for reducing their fruits to a pulp.

Vateria.—A genus of dicotyledonous plants belonging to the nat. ord. *Dipterocarpaceæ*. Only two species have been as yet described, both natives of India. *V. indica* grows all along the Malabar coast and in Canara, and is a large tree sixty feet high. The timber is valuable, and is much employed in ship-building, not being liable to be attacked by the *teredo* or ship worm. From the bark when wounded, a pellucid, fragrant, acrid, bitter, resinous fluid exudes, which, exposed to the sun, becomes yellow and fragile like glass. In England this resin is known by the name of gum anime, though in India it is usually called copal. The fluid resin makes a good varnish, and is called pundum or liquid copal. The seeds of this tree yield another substance well known in India by the name of piney, or vegetable tallow. This fatty matter is obtained by boiling the seeds, when it floats to the surface, and on cooling down becomes of the consistence of tallow.

Velella.—A genus of acalephous animals. See ACALEPHÆ.

Vellosia. *The Tree Lily.*—A genus of plants. See HÆMODORACEÆ.

Veneridæ.—A family of conchiferous *Mollusca*, composed of an immense number of shells, a great portion of which are remarkable for the beauty of their form and the variety of their colours. They differ considerably amongst themselves in the shape of their shells, the characters of their hinge teeth, and the form of the pallial impression. Hence they have been divided into a considerable number of genera, which some conchologists adopt, but others hesitate to accept. The animal has the edges of the mantle undulated, and furnished with a row of tentacular cirrhi, two respiratory syphons, capable of being more or less projected, and a large compressed foot. The shell is generally inequilateral, equivalve, regular, completely closed, and of a very hard texture. It is flattened in most of the species, and suborbicular or elongate parallel to the hinge. The teeth are generally three in each valve, always cardinal, never lateral, but in some of the genera there is a fourth small conical tooth, anterior to the others. The ligament is external. The recent species described amount, according to the latest catalogue of this family published by the British Museum, to 574! They live for the most part in the sand of the sea shore, and are found in the seas of almost all parts of the globe. Some form holes in rocks, or burrow in mud. Few are of any utility to man. The animal of *Venus* (*Tapes*) *pullastra* is eaten on the continental coasts. The *Wampum* or coinage of the North American Indians, used to be made of the sea worn fragments of *Venus mercenaria*, being perforated and strung on leather thongs. The principal genera of this large family are the following:—*Artemis*, with an orbicular, compressed, concentrically striated shell, and the animal having a hatchet-shaped foot. *Cytherea*, with a thick, ovate, smooth shell, and the hinder tooth striated. *Meroe*, with an oval, compressed shell, the lunule lanceolate, and the ligament in a deep escutcheon. *Trigona*, with a trigonal, wedge-shaped shell, a prominent, short ligament, and the hinder tooth torn and divided. *Dione*, with an oval, smooth, or concentrically ridged shell, a distinct syphonal inflection, and the hinder tooth smooth. *Circe*, with a somewhat similar but more compressed shell, and no syphonal inflection. All these genera have the anterior small conical tooth in addition to the three diverging ones. *Venus*, the

genus to which the family owes its name, and which at one time included almost all the species, has only three diverging teeth in each valve. The shell is oval, thick, smooth, sulcated, or cancellated, with the margins minutely crenulated. The pallial sinus (syphonal inflection) is small. *Tapes*, with an oblong, flattish shell, with smooth margins, and very compressed, more or less bifid teeth; the syphonal inflection is deep and rounded. The animal spins a byssus. *Venerupis*, with an oblong, radiately striated shell, ornamented with concentric lamellæ, and a little gaping posteriorly. The teeth are very compressed, small, and one of them is bifid. The syphonal inflection is moderately deep and angular. *Glauconome*, with an oblong, thin shell, covered with a dark green epidermis, and the syphonal inflection very deep and angular. The teeth are three in each valve, one of them bifid, and the syphons of the animal are very long, united, and project far into the bronchial cavity when retracted. The species of this genus are not numerous. They are found in the embouchures of rivers in China and the Philippine Islands, &c.

Venerupis (*Venus;* and *rupis*, a rock). See VENERIDÆ.

Venus. (*Heathen Goddess*).—See VENERIDÆ.

Veratrum.—A genus of monocotyledonous plants belonging to the nat. ord. *Melanthaceæ*, or the colchicum family, sub-order *Veratreæ*. The root of one of the species, *V. album*, the white hellebore of the Greeks, a native of various parts of Europe, is fibrous, and contains a quantity of an irritant, narcotic poison, the properties being due to the presence of an alkaloid called *Veratria*. It has been used as an emetic and purgative, especially in cases of mania, and also as a remedy for the gout. Two other species, *V. officinale* (placed by some botanists in the genus *Helonias*, by others in *Asagræa*), and *V. Sabadilla*, yield a fruit or seed which contains the same properties, and are sold in our shops as *Cevadilla*, *Cebadilla*, or *Sabadilla*, and from which the chief portion of our *Veratria* is now extracted. This substance is generally found combined with a peculiar fatty acid called cevadic or sabadillic acid. Cevadilla is used in cases of neuralgia and rheumatism. The species of veratrum from which it is obtained are natives of Mexico.

Verbascum (derived from *barbascum*, on account of its woolly filaments). *The Mullein.*—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*. It is composed of herbs with strong erect stems, broad decurrent leaves, and yellow, white, or purple flowers, disposed in dense or loose racemes or spikes. About seventy species have been described, a great proportion of which are natives of Europe. The great mullein, *V. Thapsus*, is a British species, and in addition to various European habitats, has been found in Nepâl. The leaves are remarkably woolly, and the English name *Mullein*, applied to the whole genus, is said to be derived from this character, and to be a corruption of the word *woollen*. At one time this plant was considered to possess emollient and narcotic properties, and even now finds a place in the Dublin Pharmacopœia. In France, an infusion of the flowers is employed to relieve coughs. The moth mullein, *V. blattaria*, another native of Britain, is said to have the power of driving away the cockroach (*Blatta*)—hence its specific name. The white mullein, *V. Lychnitis*, found not uncommon in England, the north of Asia, and North America, has the under surface of the leaves clothed with a powdery down, which is collected for the purpose of being used as tinder, and for making wicks for lamps. Its specific name is derived from this circumstance, the Greek word λυχνος signifying a lamp.

Verbena. *The Vervain.*—See VERBENACEÆ.

Verbenaceæ.—A nat. ord. of dicotyledonous plants, composed chiefly of shrubs and trees, rarely herbs, with opposite or alternate, exstipulate leaves, and small, variously coloured flowers, disposed in corymbs or dense heads. The species are numerous, upwards of 770 having been described, and are natives for the most part of the tropical regions of both hemispheres, a few advancing within the temperate parts of the globe. The stems and leaves of many of the species are spotted with sessile, resinous glands, which give them an aromatic or even fetid odour. Others possess tonic, bitter, and astringent properties. An infusion of the leaves of some is used instead of tea in some countries. The genus *Verbena* or vervain, is the type of the family, and imparts to it its name. The species belonging to it are principally herbs or under-shrubs, and the greater number are natives of America, only a few being found in the Old World. Their stem is tetragonal, the leaves generally opposite, ternate, rarely alternate, and the flowers small, and disposed in spikes or terminal heads, each accompanied with a bractea. Several species are much cultivated as ornamental plants, the chief stock from which the numerous varieties now produced by horticulturists being *Verbena chamædrifolia*, a native of Brazil and La Plata. The common vervain, *V. officinalis*, is a native of England and other parts of Europe, and is also found in Australia. It was a plant held in great estimation by the ancients, who styled it the "holy herb," and ascribed great powers to it, especially in incantations. The priests used it for cleaning the altars, and sprinkling them with water; and the heralds used to wear it round their heads when they went forth to announce peace or war. The ancient Druids revered it, next to the mistletoe, and their gathering it was accompanied with religious ceremonies. Several plants belonging to this nat. ord. have already been mentioned; as the teak tree—see TECTONA; the plants used in Brazil as a substitute for tea, see LANTANA; see also VITEX.

Vermetus (*vermis*, a worm). *The Worm Shell.*—A genus of mollascous animals belonging to the class *Gasteropoda*, and forming the type of the family *Vermetidæ*. The shell of these animals is tubular, worm-shaped, twisted in a variety of ways, and so similar to the shelly case of some of the annelides, *Serpula*, for instance, as scarcely to be distinguished from them. The shelly tube is very long in proportion to the animal which inhabits it, so that all the posterior portion becomes successively useless to the mollusc, and is divided into separate portions by a shelly partition, placed internally at irregular distances. The species are generally found twisting and twining with several individuals of the same species, and thus becoming fixed, though they are sometimes also found attached separately to stones, dead shells, &c. The animal possesses a horny, many-whirled, circular operculum, which fits the mouth of the shell. The genus has lately been divided into several sub-genera, and contains a considerable number of species, which are found in the seas of most parts of the world. The fossil species referred to the genus are very difficult to be distinguished from species of *Serpulæ*, without the tube being laid open.

Vermiculite (diminutive of *vermis*, a worm).—A mineral substance, composed of silica, magnesia, peroxide of iron, alumina, and a trace of manganese. It consists of micaceous plates, disseminated through a mealy, magnesian substance, and having a soapy lustre, and a greasy feel. When heated nearly to redness, it projects out with a vermicular motion, as if it were a mass of small worms; hence its name. It is found at Vermont, in the United States.

Vermilea (*vermis*, a worm).—A genus of tube inhabiting annelides belonging to the family *Serpulidæ*. The shelly tubes are so like those of the *Vermetus* that it is difficult, without seeing the animals, to distinguish them. They are attached by the whole length of the shell to rocks, stones, old shells, &c., and have in general a keel running along the dorsal surface.

Vermileo (*vermis*, a worm; *leo*, a lion). *Ant-lion.*—A synonym of the genus LEPTIS.

Vermilion.—A mineral substance. See CINNABAR and MERCURY.

Vernonia (after *W. Vernon*).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, consisting of herbaceous, shrubby, and arborescent plants, natives of warm climates. They have alternate, rarely opposite, often glandular leaves, and flowers disposed in the form of scorpioid heads, of a purple, rosy, or white colour. Upwards of 375 species have been enumerated, several of which, as *V. noveboracensis*, a native, as its name imports, of North America, and found abundantly on the borders of woods and in pasture fields from Carolina to Canada, are cultivated as objects of ornament for the garden. *V. anthelmintica*, a native of India, possesses medicinal qualities, which have caused it to be employed as an anthelmintic or vermifuge, and in cases of gout and rheumatism.

Veronica. *The Speedwell.*—A genus of dicotyledonous plants belonging to the nat. ord. *Scrophulariaceæ*, and though cut down considerably of late years by botanists, still contains upwards of 158 species. These are herbaceous, shrubby, or even arborescent plants, and are natives of most temperate climates. The leaves are alternate, verticillate, or opposite, often dentated, and the flowers are of a blue or white colour, either solitary or united into a spike. Some of the species are very beautiful, and several have added lately to the list of our ornamental garden plants. About twenty species are natives of Great Britain, amongst which we may mention the germander speedwell, *V. Chamædrys*, a favourite with all, and a great ornament to our hedge-rows, road-sides, and paths. In Scotland it is sometimes called the *milkmaid's eye*, and *eye-bright*; and in France is known by the name of "plus je vous vois, plus je vous aime!" The brooklime, *V. Beccabunga*, in addition to being a British species, is a native of most parts of Europe, North America, and Nepál. It is a glabrous plant, grows in moist places very abundantly, and has been considered to possess powerful antiscorbutic properties. *V. officinalis*, the common speedwell, was by one botanist, Paullix, a Dane, considered to be identical with the tea plant of China, and the leaves have frequently been used as a substitute for tea.

Vertebrata (*vertebra*, from *verto*, to turn, the bones of the spine).—A sub-kingdom of animals distinguished by the possession of a vertebral column and a spinal marrow. In this grand group of the animal kingdom are contained the *Mammalia*, *Aves*, *Reptilia*, and *Pisces*. Their geological eras may be briefly stated thus:—*Fishes* occur for the first time in some of the most ancient formations, having been found in the upper silurian. *Reptiles* appear for the first time in the middle palæozoic strata. *Birds*, rare at any period, begin to show themselves in the wealden formation, in the middle mezozoic strata. And *Mammalia* appear in the tertiary formations, occurring in the middle eocene beds.

Vespa. *The Wasp.*—See VESPIDÆ.

Vespertilionidæ.—A family of bats. See CHEIROPTERA.

Vespidæ. *The Wasp family.*—A family of aculeated hymenopterous insects, composed of the species of the Linnæan genus *Vespa*, and to which the wasps and hornets belong. The principal character of these insects is taken from the structure of the wings. These, when the insect is at rest, are folded throughout their entire length; the fore wings have one marginal and three sub-marginal cells, with an incomplete terminal, sub-marginal cell; and in all the species the neuration is the same. Some wasps are solitary in their manner of life, and these have been

separated from the social species, and formed into a distinct family. See EUMENIDÆ. The social wasps, the true or restricted family *Vespidæ*, are very interesting insects. Their bodies are usually black, with yellow markings, they have strong and dentated mandibles, and the females and neuters have a long, powerful, and venomous sting. Their legs are unprovided with apparatus for collecting pollen. They live in societies composed of males, females, and neuters or workers, but their communities are generally only temporary, being dissolved at the commencement of winter. The nests in which they live, called sometimes vespiaries, are either built under ground, in holes in banks, or are attached to the branches of trees or the woodwork of outhouses. The nests of these latter, or tree wasps, are finest and closest in texture, being constructed of ligneous fibres, torn or scraped off from gate-posts, blocks of wood, and trees, &c., which is reduced to a paste by the action of the jaws. Within these nests, which are varied in size and appearance, they construct hexagonal cells, arranged in combs like those of the bee (see APIDÆ), and in which the larvæ and pupæ are contained. A large nest sometimes contains 100 females; and though few escape the rigour of winter, the few that do, being previously impregnated by the males, and protected from the weather in some sheltered spot, emerge in spring, and commence with the greatest industry to construct a new habitation. The males, like those of the bees, perform no menial work; this is left to the neuters, which are always the most numerous and the busiest of the community. These are the architects, soldiers, and commissaries of the community. They build the nest, gather provisions, regulate the nurseries, and revenge insults. Wasps are very voracious, preying upon other insects, sugar, meat, fruit, honey, &c. The larvæ are fleshy grubs, destitute of feet, but furnished with lateral tubercles, and are fed daily by the perfect insects, who prepare the food for them in their stomachs. Several species of wasps are natives of this country. The common wasp, *Vespa vulgaris*, too familiar to need description, is a ground wasp,

Vespa crabro—The Hornet.

forming its nest in holes in banks, &c.; while the hornet, *Vespa crabro*, a much larger insect, and much more formidable, builds its nest in holes in the trunks of trees, or in old walls. The hornet is of a dark brown and yellow colour, and is very voracious and pugnacious. The common wasp seems to be a favourite prey, though it eats almost any kind of flesh, as well as fruit, honey, &c. Their nests are smaller than those of the common wasps, and are of a globular form, constructed with the mouths of the cells downwards. They are active creatures, fly rapidly, and have been observed, unlike most insects, to carry on the labours of building their nest by moonlight. The sting of the hornet is very severe, and is often productive of serious consequences. *Vespa Britannica* is a tree wasp, and builds its nest of a thin substance, like paper, but of a very fine and close texture, and suspends it from the branch of a tree. Some foreign species, as those of the genus *Chartergus*, make their nests of a substance like pasteboard. Hence they are called pasteboard wasps. The nest of *C. nidulans*, a native of Brazil, is of a beautifully polished white appearance, and so solid as to be impenetrable by the weather. It is generally securely attached to the branch of a tree by its upper end, and varies a good deal in length. In the warm climate which these wasps inhabit, the societies which they form are not broken up each year, as those of colder countries, but the females turn out, and emigrate to a distance, to establish new colonies. The external surface of some of these pasteboard nests is covered with conical knobs of various shapes, and is very hard, and of a close texture. That of *Myrapetra scutellaris*, a native also of Brazil, is of an oblong shape, and is said by the natives to be formed principally of the dried dung of a species of tapir or water-hog, called the carpincho. This species of wasp is remarkable amongst its congeners by the fact that it is a honey-making wasp. The honey contained in the combs is of a brownish-red colour, but, when new, possesses scarcely any smell or taste.

Vibrio (*vibro*, to agitate by undulations). *The Trembling Animalcule.*—See VIBRIONIA.

Vibrionia.—A family of minute organisms, which have always, until lately, been arranged under the class *Infusoria*, and from possessing apparently spontaneous motions, have been considered as belonging to the animal kingdom. They are exceedingly minute, and even with a high magnifying power it is with the greatest difficulty their structure can be made out. The supporters of their animal nature describe them as merely slender lines, sometimes straight and sometimes sinuous, without any appreciable organization or any visible organs of motion, but possessing a degree of contractility which appears to be of a voluntary nature. Later observations, however, prove at least a great part of these organisms to be in reality plants belonging to the order *Algæ*, and tribe *Oscillatoriaceæ*. They appear to be composed of minute joints, and to be propagated by the formation of new joints, and subsequent separation at one of the arti-

culations. They appear very rapidly and even suddenly in artificial infusions, and though exceedingly minute, are in such immense numbers as to form a thick scum on the surface. They are also found in the tartar of the teeth, in the purulent matter of certain tumors, and in some other fluids of animals, when altered by disease. The nature of the movement of these bodies has induced the believers in their animal nature to form two distinct genera. The species referred to the genus *Vibrio* have an undulatory and sinuous motion, like that of a serpent, whilst those belonging to the genus *Spirillum* have a rapid and gyratory movement.

Viburnum.—A genus of dicotyledonous plants belonging to the nat. ord. *Caprifoliaceæ*, composed of shrubs with opposite, petiolate leaves, and corymbose flowers. They are natives of Europe, America, and Asia, and several of the species being of easy culture in this climate, are well known favourites of our shrubberies and gardens. The Laurustinus, *V. Tinus*, is one of these, and though now to be seen in almost every garden throughout Great Britain, is originally a native of the south of Europe and the north of Africa. Lord Monboddo used to say it was easy to see it was an exotic, for it is so ignorant of our seasons as to blossom in December and January, while the natives were destitute of both flowers and leaves! The tree viburnum, *V. Lentago*, a native of North America, and the wayfaring tree, *V. Lantana*, a native of Europe and the west of Asia, are also commonly cultivated in England; while the guelder rose, or snow-ball tree, *V. Opulus*, so well known in gardens and shrubberies for its fine large cymes of white flowers, is a native of Great Britain, and by no means uncommon in various parts of the country.

Vicia. *The Vetch.*—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*. The species of which the genus is composed are trailing or climbing herbs, natives of all temperate climates, and some extensively cultivated for their utility. Their leaves are abruptly pinnate, with many pairs of leaflets, the common petiole terminating in a tendril at the apex, and accompanied with semi-sagittate stipules. The peduncles are either one or many-flowered, and the legume is one-celled and many-seeded. The type of the genus is the common vetch or tare, *V. sativa*. This well known plant is very common in Great Britain and throughout the rest of Europe, and is extensively cultivated as an excellent fodder for cattle. A variety of it, the white vetch, is sometimes used as food for man. The grain is much larger than that of the common kind. The wood vetch, *V. sylvatica*, and the tufted vetch, *V. cracca*, are two very handsome species, and greatly ornament our hedges.

Victoria (after Queen *Victoria*).—A genus of dicotyledonous plants belonging to the nat. ord. *Nymphæaceæ*, or the water lily family. The species upon which the genus was founded, *V. regia*, is a magnificent plant, growing in the fresh waters of Guiana and North Brazil. The leaves are of an immense size, orbicular, turned up round the edges, and from four to six feet in diameter. It is asserted that a well grown child can stand upon them without its weight sinking it under the surface of the water. The flowers are sweet-scented, of a magnificent size, being a foot in diameter when expanded, white, with a purple centre, and composed of an immense number of petals. The seeds are eaten, roasted like those of Indian corn. A second species has been found in the deep stagnant waters of the province of Corientes, on the banks of the Parana. This species has received the name of *V. cruziana*.

Vidua. *The Widow Bird.*—See PLOCEINÆ.

Villarsia (named after *M. Villars*, a French botanist).—A genus of dicotyledonous plants, composed of about sixteen species of aquatic or marsh plants, with alternate entire leaves, and yellow flowers. Only one of them is a native of Europe. This species, *V. nymphæoides*, is a floating plant, with orbicular cordate leaves, and the segments of the corolla ciliate. It is a rare plant in Britain, but is very abundant in Holland, frequently covering large tracts of the canals with its beautiful, large, yellow flowers, and dark green leaves.

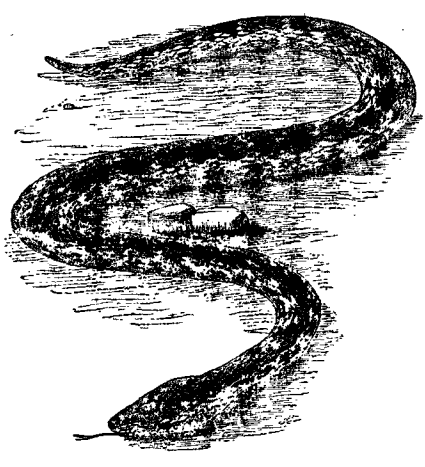
Vinca (*vinco*, to bind.) *The Periwinkle.*—A genus of plants. See APOCYNACEÆ.

Viola. *The Violet.*—See VIOLACEÆ.

Violaceæ.—A nat. ord. of dicotyledonous plants, composed of herbs and shrubs, the former abounding without the tropics in the northern hemisphere, the latter growing within the tropics, and almost exclusively in America. The leaves are generally alternate, rarely opposite, simple, entire, or laciniate, and stipulate. The flowers are solitary, each upon a peduncle, which is often furnished with two bracteæ. Many of the species possess acrid properties, which are due to the presence of a peculiar principle called *Violine*. This is somewhat similar to *emetine*, and gives them the emetic qualities of ipecacuanha. The genus *Viola*, containing the plants well known under the name of violet, is the type of the family, and gives it its name. The species are numerous, nearly 200 having been described. They are almost all herbaceous plants, natives of the temperate parts of the northern hemisphere; a few only being shrubby, and found growing in the southern hemisphere. Several species are natives of Great Britain, amongst which the common sweet violet is the most remarkable. The violet is too well known to need description. Poets, painters, and horticulturists unite in their admiration of this modest-looking flower, and several varieties have been reared. Its sweet odour needs no comment, but it affects some people in a peculiar way, producing nervous symptoms that are very troublesome. On the continent the violet is employed as a medicine, and is considered useful as a pectoral remedy, and in cases of rheumatism

and catarrh. The syrup of violets is also very much used by chemists to test the presence of acids and alkalies, being rendered green by the latter and red by the former. The pansy, or heart's-ease, *V. tricolor*, is another common species indigenous to Britain, and found also throughout all Europe, in Siberia, and North America. This plant is exceedingly variable in appearance, and by cultivation produces an immense number of varieties, the rearing of which forms a considerable article of commerce. The most récherché varieties of pansies, however, are not exclusively the produce of *V. tricolor*, but are hybrids between it and another species, a native of the Altai mountains, and called *V. altaica*. The cultivation of pansies took its rise in England, and it is to the care and patience of English horticulturists that we owe the perfection to which these beautiful plants have reached. At one time physicians attributed a great degree of virtue to the wild viola tricolor in diseases of the skin, especially scald head, and similar diseases in children. It has now, however, fallen into complete disuse.

Viperidæ (*vivipara*, viviparous, bringing forth young alive). *The Viper family.*—A family of poisonous reptiles, belonging to the order *Ophidia*, or snakes. The species are distinguished by the want of a sub-orbital pit on the side of the face, by the upper jaw being toothless, with fangs in front, and the rostral shields being broad and band-like. The body is cylindrical and scaly, the scales being almost always keeled, the head shortened, obtuse in front, enlarged posteriorly and somewhat heart-shaped. The tail is short



Vipera berus—The Adder.

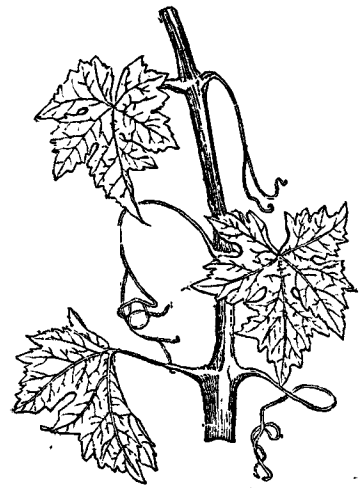
and tapering, and furnished with one or two rows of plates underneath. The species are about twenty in number, and are found chiefly in Africa and Asia, only three being found in Europe, and one in Australia. The genera are nine in number, but were at one time all described under the general name of *Vipera*. The only British species is the common viper or adder, *Vipera* (*Pelias*) *berus*. This snake is spread over all the temperate and warm parts of Europe, inhabiting dry stony places and heathy and bushy hills. It is generally about two feet, rarely three, in length, and is of a brownish colour, with a series of rhomboidal black spots throughout the whole length of its back, and a row of triangular spots on the sides. The nose is blunt, the eyes are bordered with black, small and very brilliant, and the tongue is long, protractile, and forked at the extremity. During winter the adder remains in a state of torpidity in deep holes, several individuals being often found twined together. At the return of spring they quit their retreats and pair. They are viviparous, bringing forth young instead of eggs. Their food consists of insects, worms, shrews, field mice, and young birds, &c. The adder is the only poisonous reptile found in Great Britain, and though its venom is less virulent than that of many other serpents, it is yet often attended with very alarming effects. When it is about to bite, it generally, in the first place, throws itself into a coil more or less close, and raises the anterior part of the body. The neck is bent somewhat abruptly backwards, and the head fixed almost horizontally. In an instant the head is, as it were, launched by a sudden effort towards the object of its anger, and its fang, which is erected by means of a small muscle, is struck into it with the velocity of thought. The remedy against the bite of the adder is rubbing the part affected with olive oil over a chafing dish of coals. The horned viper, *Cerastes Hasselquistii*, is remarkable for the presence in the males of a horn-like scale over each eye. It is of a brownish-white colour, marked with pale brown, irregular unequal spots. The valley of the Nile, and the warm parts of North Africa, are the native places of this species of viper, and it is the snake which we find represented by the Egyptians on their obelisks and other monuments. The female of the horned viper has no horn-like scales over the eye, and has consequently been sometimes described as a distinct species. It is supposed by some to be the asp of Cleopatra. The puff adder, or short-tailed viper, *Clotho arietans* (= *Vipera inflata*), a native of the Cape of Good Hope, is considered the most deadly snake of South Africa. It is of a brown colour, with an angular cross band, edged behind by a pale line, and a red cross band across the eyes. The death adder of Australia, *Acanthophis antarctica*, is the only Australian snake of this family. It is generally diffused over that country, and is much dreaded by the colonists, who express their fear of it by the name they have bestowed. It is asserted that people have died within a quarter of an hour after being bitten.

Vireoninæ.—A sub-family of fly-catchers. See MUSCICAPIDÆ.

Virgularia.—A genus of zoophytes. See ANTHOZOA.

Viscum.—A genus of dicotyledonous plants belonging to the nat. ord. *Loranthaceæ*, and containing the well known plant called the mistletoe. This parasitical plant, *V. album*, though of no use to man, is one of considerable interest. The seeds in germinating differ from those of all other plants. Instead of the radicle of the embryo shooting downwards and the plumule upwards, the radicle of the mistletoe invariably turns itself down upon the body to which it is attached, whatever may be the position of the surface of that body with respect to the earth, so that they grow equally well upon the branches of trees, whatever side they happen to be attached to. The fruit contains a viscid matter like birdlime, by means of which the seeds adhere to trees, and as these are the favourite food of the missel thrush, they are carried by these birds and scattered over the trees of the district. The mistletoe is intimately associated with Druidical superstitions, and by the Druids was called the mistletoe of the oak. It is now, however, rarely found upon the oak tree, but it grows well on the apple. From the viscid pulp covering the seeds, a kind of birdlime is made in Italy and in Herefordshire.

Vitaceæ = Ampelideæ (ἀμπελις, the vine). *The Vine family.*—A nat. ord. of dicotyledonous plants, composed of climbing shrubs, with the lower leaves opposite and the upper ones alternate. The flowers are small, and disposed in racemes, the peduncles sometimes becoming cirrhose, and the fruit is a globose berry. The six or seven genera which compose this family, contain about 260 species, most of them natives of the warmer parts of the northern temperate zone both in the Old and New Worlds. The characteristic property of this order is acidity, and this is most fully developed in the genus *Vitis*, which is the type of the family. The species of this genus are chiefly natives of the central parts of Asia, and of North America. Their leaves are alternate, simple, heart-shaped, entire, or lobed. The flowers are arranged in racemes opposite the leaves, and a number of them remain sterile, and ultimately degenerate into cirrhi. The fruit which succeeds the flower is a bilocular, globular berry, the seeds lodged in a sweet mucilaginous substance. About forty-five species have been described, but there is one amongst these which far surpasses all the rest in importance to man. This is the grape vine, *Vitis vinifera*, a plant, the cultivation of which gives employment to many thousands of human beings in various parts of the world. Its native country is not quite clearly ascertained, but there seems to be little doubt of its being indigenous in the East, and it is believed to be more particularly a native originally of Arabia Felix. The cultivation of the vine appears to succeed best in temperate climates, as the fruit will not ripen well where the mean annual temperature is below 19° of centigrade = 59° Fahrenheit, and degenerates in those countries placed under the tropics. It succeeds best in those countries which enjoy a long summer, and in which the temperature of the months of September and October is sufficiently high to allow the fruit to ripen thoroughly. The vine seems to have been known from the remotest antiquity, and is one of the plants of which we have the earliest records in the Books of Moses. Its manufacture into wine appears also to have an equal antiquity. The Phœnicians were the first to introduce the vine into Europe, transporting it into Greece and Italy, from whence it spread to France, Germany, and other parts of the continent, where its cultivation has become of such vital importance. The great variety of wines produced from this plant is very remarkable, and it has accordingly been attempted to be proved that several species of vine enter into this manufacture. At present, however, it is more generally believed that the different kinds of vine producing the different sorts of wine are all mere varieties of *V. vinifera*. In no country perhaps is there such a large tract of land under cultivation with the vine as in France. The surface under cultivation amounts to about 2,000,000 of hectares, and the quantity of wine produced, upwards of 35,000,000 of hectolitres, equal to 770,000,000 imperial gallons, worth £21,600,000. Besides producing wine the vine affords other materials of considerable importance. The well known spirit called brandy is distilled from the strong and harsh wines and the husks of grapes. The best brandy is obtained from France, and the



Portion of a branch of the Vine—*Vitis vinifera*.

chief distilleries are at Bordeaux, Rochelle, Cognac, &c. The quantity of brandy exported from France amounted in 1828 to 10,252,728 gallons (equal to 403,207 hectolitres). From the lees, and especially the incrustations left on the sides of the casks, the substance called cream of tartar, *Bitartrate of Potash*, is obtained. The leaves are used as food for cattle, and the stems tied in bundles as fuel, by the inhabitants of the vine countries, whilst the ashes left from the combustion are employed by agriculturists as a manure. Grapes are also dried, and used under the name of raisins. The drying is generally effected by cutting half through the footstalk whilst they are suspended on the tree, and the grapes thus dried are called muscatel raisins. A different species of vine from the grape vine, a native of the Ionian Islands, especially Zante and Cephalonia, produces the small fruit which when dried is known by the name of currants, or corinths. The trade in these dried fruits is considerable, the duties upon them during the year ended March, 1856, amounting to £353,066. The grape vine acquires by age a large size, some old trees being known upon which 4,000 bunches of grapes have been counted.

Vitex.—A genus of dicotyledonous plants belonging to the nat. ord. *Verbenaceæ*. *V. agnus castus* is a shrub about twelve feet high, and a native of the south of Europe. The flowers are arranged in spiked whirls, and have an agreeable fragrance. The fruit is round, rather smaller than black pepper, with an acrid and aromatic taste, whence it is called petit poivre, and poivre sauvage, in the south of France. In India two or three species occur. They possess the same properties, and have the name "filfil burree," or wild pepper.

Vitis. *The Vine.*—See VITACEÆ.

Vitrina (*vitrum*, glass).—A genus of gasteropodous *Mollusca*, belonging to the order *Pulmonifera*, the proper place for which is between the *Limacidæ* and *Helicidæ*. The shells are slender, very thin, transparent, and brittle. The spire is short, the last whirl large, and the mouth wide and open. The animal is too large to be able to retire completely within the shell, and is elongate and limaciform. The species are rather numerous, about sixty-four having been described, and occur in many parts of the world. Those of Europe are small, and live in humid places. Those of hot climates are much larger.

Viverridæ. *The Civets.*—A family of carnivorous animals belonging to the class *Mammalia*, order *Feræ*. The civets are characterized by having an elongated compressed body, with short legs, and a long muzzle. They have two tubercular grinders in the upper and one in the lower jaw, and the hinder one in the upper jaw is triangular transverse. The tongue is covered with sharp papillæ; the claws semi-retractile; fur generally spotted, that of the tail annulated. The anal pouch is provided with glands which secrete an odorous matter. They may be divided into two groups; one having the soles of the feet hairy, the others naked. Of the former, the genus *Viverra* may be considered as the type. The anal pouch is divided into two bags filled with an abundant concretion of the substance of pomade, exhaling a strong musky odour. The pupil of the eye is round during the day, the claws are only half retractile, and the teeth consist of six incisors and one canine in both jaws,

Viverra Civetta—The Civet.

six molars in upper and four in lower jaw. The civet, *Viverra Civetta*, is one of the best known species. It is of an elongate form, from two to three feet long, and ten or twelve inches high, with a tail about half as long as the body. It is of a brownish-gray colour, with numerous, interrupted, transverse black bands or spots on the body and tail. It is a native of North Africa, and lives upon birds and small quadrupeds, which it attacks chiefly at night. The civet is often kept in captivity by the natives of Africa, in order to obtain the well known and celebrated perfume which bears the name of the animal, and which is the substance contained in the anal pouch. This civet is obtained by scraping the inside of the pouch with an iron spatula at intervals about twice a-week, and brings a high price when pure, from thirty to forty shillings an ounce. Civet is procured likewise from the rasse, *V. malaccensis*, a native of Java. This animal inhabits the forests at a moderate elevation above the level of the ocean. It preys upon small birds and animals, and is very sanguinary in its habits. The perfume is obtained in the same manner as in the civet, and is a great favourite amongst the Javanese of all ranks and classes. The apartments of natives of rank are generally scented with it to such a degree as to be offensive to Europeans. In the genus *Genetta* the heels have a narrow naked band; the anal pouches are

reduced to a small size, and have no sensible excretion, although the odour is manifest. The pupil has a vertical slit, and the claws are entirely retractile, as in the cats. The common genet, *G. vulgaris* or *tigrina*, is rather a pretty animal, about the size of a small cat. Its fur is beautiful and soft, its body is elongated, the muzzle sharp pointed, and the tail very long, and marked with black and white rings. It is of a pale reddish-gray colour, the sides of the body being spotted with black, and a dark line runs along the back. It is a native of the western parts of Asia, and is found in the south of France, in Spain, and at the Cape of Good Hope. It is of a mild disposition, and easily tamed. At Constantinople it is domesticated and kept in the houses, and is said to be equally useful as a cat in clearing them of rats and other vermin. For other species with hairy soles, see PRIONODON and PROTELES. Of those in which the soles of the feet are naked, we may refer to the genera HERPESTES, ICHNEUMIA, PARADOXURUS, CYNICTIS, and CYNOGALE.

Vivianite. *Phosphate of Iron.*—A mineral. See FERRUM.

Vivipara (*vivus*, living; *pareo*, to bring forth).—Viviparous animals are those in which the eggs are hatched within the body of the mother, and the young are brought forth alive, and free from the envelope of the egg. All the mammalia, many reptiles, and various tribes of the lower orders of animals are *viviparous*; while all birds, fishes, many reptiles, and numerous tribes of the lower animals, are, on the contrary, *oviparous*.

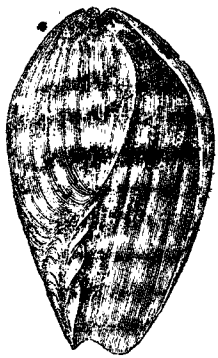
Voltzia.—A genus of fossil plants belonging to the secondary strata. It belongs to the nat. ord. *Coniferæ*. The species here figured will illustrate the genus.

Voltzia heterophylla.

Voluta (*volutus*, rolled or twisted). — See VOLUTIDÆ.

Volutidæ.—A family of gasteropodous *Mollusca*, containing many species, the shells of which are highly prized by collectors. In general they are large and handsome, many of them elegantly formed, and several highly coloured. They are found living in the sandy bottoms of the seas of warm climates. The genus *Voluta* is the type of the family, and originally contained not only all the species which now form the family, but a good many more, which have been removed to other families. The shell is oval, oblong, or swollen, with a short spire, and a blunt apex. The mouth is large and elongate, with simple edges, and deeply notched at the anterior extremity. The columella is marked with several very distinct, oblique plaits, the lowermost of which is the largest. Some of the volutes are widely open, and the spire is nearly concealed by the last whirl. These form the sub-genera *Melo*, *Yetus*, and *Cymbium*, and it is a species of the first of these genera we have selected for our representation of the family. In general the shell of the volutes is covered with a distinct periostraca; but in these two latter genera, when any sand or other matter gets between the shell and the upper surface of the foot of the animal, it secretes a quantity of shelly matter, and covers the adventitious substance with a glassy coat, so as to prevent the extraneous particles from irritating it. These three sub-genera contain the largest species in the whole family, and are used by the natives of the Eastern seas and Australia for baling their boats, when they let in water. The other species, which are more solid, and in which the spire is distinct, belong to the more restricted genus *Voluta*, though these have of late been subdivided into several sub-genera. Amongst the most valuable of these is the rare *Volata* (*Scapha*) *Junonia*, a well marked and handsome shell, from the Gulf of Mexico; and *V.* (*Scapha*)

Aulica, from the Sooloo Islands. One species, a native of the West Indies, *Voluta musica*, the music shell, is remarkable for the disposition of its colours, showing a more or less exact repre-



Melo Indicus.

sentation of a bar of music; hence its name. A good many species of volutes have been found fossil. They are most abundant in the tertiary formations.

Volvaria (*volva*, a wrapper).—A genus of fossil gasteropodous *Mollusca* belonging to the family *Volutidæ*. The shell is cylindrical, convolute, spire minute, aperture long and narrow, and columella with three oblique plaits in front. The species are very few, and exist in the eocene beds.

Volvocineæ.—A family of minute organisms, formerly arranged by zoologists in the class *Infusoria*, but now claimed by the botanist, and generally believed to belong to the confervoid *Algæ*. They may be characterized as "plants composed of a number of permanently active zoospore-like bodies, associated together into families of a definite form, a kind of polypidom, in which the members, connected or held together in various ways by cell membranes, retain their distinct individuality for all physiological purposes of nutrition, growth, reproduction, &c., but represent only one being in relation to the surrounding objects." The type of the family is the genus *Volvox*, commonly known as the globe animalcule, which appears in the form of a small globe, or gelatinous, transparent ball, covered with a membrane, studded all over with greenish specks, and exhibiting round its external edge a large number of zoospore-like bodies, each provided with a pair of cilia, which hang out externally, and from their vibration produce a rotatory motion of the whole globe. The best known species is the common globe animalcule, *Volvox globator*. It is common in clear, stagnant pools, on open commons, &c., and presents the appearance of a minute, pale green globule, gently moving about in the water, with a motion like that of rolling over and over. In the interior of this little globe we see six or eight smaller ones, of a dense structure, and a deep green colour. These are young *Volvoces;* and inside these again we see still smaller globules, of the same colour. Four generations may thus be seen at once, contained within these hollow, gelatinous-looking spheres. The parent envelope is flexible, yielding to pressure, and again recovering its form; and when the specimen has become full-grown, is generally ruptured at one point, the internal bodies escaping through the rent.

Volvox (*volvo*, to roll). *The Globe Animalcule.*—See VOLVOCINEÆ.

Vorticella (dimin. of *vortex*, a whirlpool). —*The Bell-shaped Animalcule.*—See VORTICELLIDÆ.

Vorticellidæ.—A family of minute animals belonging to the class *Infusoria*. The little creatures of which this family is composed are very variable in form, and possess great contractility, sometimes spreading out in the shape of a bell, or a vase, or a funnel, or in the form of the corolla of a flower, with the limb entire; at others, contracting into the shape of a globule, or assuming an oblong, oval form, and pleated. In the first stage of their existence they are fixed by their base to other objects, and are provided with a crown of vibratile cilia, disposed on their anterior border, which they can retract and withdraw into the interior of their body. During a second period of their existence, these animals become free, and swim freely in the water. They are found generally in pure water, fresh or marine, and in their first stages are fixed upon herbs, or shells, or crustacea, such as the little *Cyclops*, &c., or on the larvæ of neuropterous insects. They propagate by spontaneous division longitudinally, or by germination, or buds springing from the insertion of the pedicle. The genus *Vorticella* is the type, and is composed of about ten species. No animals more excite the admiration of naturalists than the *Vorticellæ*, or bell-shaped animalcules. Their crown of vibratile cilia, in almost constant motion, and producing a regular whirlpool in the water around them; their variable form, so different at different periods of their life; and their pedicle admitting of being contracted briskly in a spiral form, like a corkscrew, drawing the body backwards, and then extending it,—all conspire to render them most interesting objects for the microscope. In the earlier periods of their existence they are fixed at the extremity of a simple or branched footstalk, which is a membranous cord, flat, thicker upon one of its edges, and exceedingly contractile. The crown of vibratile cilia is the organ by means of which the food is brought within their reach, when thus fixed; and in the second period of their existence, when swimming freely, is withdrawn completely, as no longer necessary. Their organs of motion are then a row of thick, undulating cilia, near the posterior extremity of the body, and directed for-

wards. Three other genera belong to this family, and resemble in their habits and mode of life the species of that just described.

Vulpes. *The Fox.*—See CANINA.

Vulsella.—A genus of conchiferous *Mollusca* belonging to the family *Aviculidæ*. The species are not numerous, only three or four having been described. The shells are elongate, in the direction perpendicular to the hinge; they are narrow, striated, sub-equivalve, their umbones straight, earless; they are nacreous internally, and covered externally with an epidermis. The cartilage pit is large, and always produced into the cavity of the shell. They do not attach themselves to other bodies, like the *Aviculæ*, but remain free, or bury themselves in living sponges.

Vulturidæ. *The Vulture family.*—A family of rapacious birds belonging to the order *Accipitres*, and sub-family *Diurni*. In the birds of this family the eyes are placed laterally, on a level with the surface of the cheeks, the head and neck are more or less naked, or denuded of feathers, the bill is not toothed, the tarsi are short and covered with reticulated scales, the claws but slightly curved, blunt, and the crop is prominent. They are chiefly confined to warm climates, and live for the most part on carrion. In this respect, indeed, they act as scavengers, to purify the earth from the putrid carcases with which it would, in those climates, be encumbered. No sooner is an animal dead than its carcase is surrounded by numbers of these birds, who suddenly appear, coming from all quarters, in situations where not one had just before been seen. The species are not numerous, but their distribution is wisely regulated according to their usefulness. Sparingly scattered over the south of Europe, more numerous in Egypt, and more plentiful, in individuals at least, in tropical America, they appear exactly proportioned to the need for their services. There are two principal groups or sub-families, the *Vulturinæ* or true vultures, characterized by their having strong bills and nostrils perpendicular; and the *Sarcoramphinæ* or condors, characterized by having slender, lengthened bills, and longitudinal, exposed nostrils. The true vultures, *Vulturinæ*, are all natives of the warm parts of the Old World. The griffon vulture, *Vultur* (*Gyps*) *fulvus*, is a European species, inhabiting the mountainous parts of the north of that continent, as Silesia, Dalmatia, the Tyrol, Spain (abundant near Gibraltar), the Alps, Pyrenees, Turkey, the Grecian archipelago; and being also found in Persia and the north of Africa. This bird is about four feet in length, and is of a yellowish-brown or Isabella colour, the head and neck being, unlike the generality of vultures, covered with close set, short, white, downy feathers; while round the lower part of the neck there is a ruff of long, slender, white feathers, sometimes with a slight tinge. Its food consists almost entirely of carrion; for although it has been known to prey upon living victims, its blunt and slightly curved talons unfit it for attacking any animals but such as are incapable of making any resistance. The griffon builds its

Vultur (*Gyps*) *fulvus*—Griffon Vulture.

nest upon the most elevated and inaccessible rocks, or upon the loftiest trees of the forest. The sociable vulture, *Otogyps auricularis*, is a fine large species, measuring ten feet in alar extent, and is a native of South Africa. The head and greater part of the neck are red and naked, the plumage of the body of a blackish-brown colour above, and lighter beneath. It is a mountain bird in its habits, haunting the caverns of rocks, and passing the night among the lofty crags. Though a heavy bird to rise in the air, yet, when once on the wing, its flight is grand and powerful. It soars so high that its huge body is lost to sight; but it is remarkable, that the moment any animal sinks dead to the earth, this, to the human eye invisible vulture, immediately detects it, and flies direct to its prey. The wonderful power which these birds have of detecting their proper food at great distances has given rise to considerable discussion. By some observers it is made to depend upon the scent, by others, entirely upon the sight. It is probable, however, that both these senses are called into action, and that both are made to contribute to their finding the dead carcase. Of the *Sarcoramphinæ*, the condor, *Sarcoramphus gryphus*, may be taken as the type. This immense bird is a native of the Andes, choosing as its breeding place an elevation of from 10,000 to 15,000 feet above the level of the sea. It makes no nest, but lays two large white eggs on a shelf of bare rock, and there rears its brood. The adult bird is about four feet in length, and measures nine feet in expanse of wing. Their flight is heavy and majestic; and it is remarked that, except when rising on the wing, they are never seen to flap their wings; but wheeling in circles, and moving in large curves, they glide along without the

least apparent vibratory motion. Though the condor, like the other vultures, feeds upon carrion, it is said that two will sometimes unite, attack and overpower the puma or the llama. The king vulture, *Sarcoramphus* (*Cathartes*) *Papa*, is another large species of this family, and is a native of the central parts of America, though it is occasionally seen as far to the north as Florida, and south, as Paraguay. Like the condor, it soars to a great height, and is said to be extremely patient of hunger, and never to attack live animals, unless when pressed by extreme hunger, when it will feed upon snakes and lizards. The naked skin of the head and neck is brilliantly coloured, and the cere is of a bright orange, prolonged between the nostrils into a comb, about an inch and a-half long, loose in texture, and falling on either side of the bill, when the head is erect. For an account of the Turkey buzzard and Californian vulture, see CATHARTES.

W

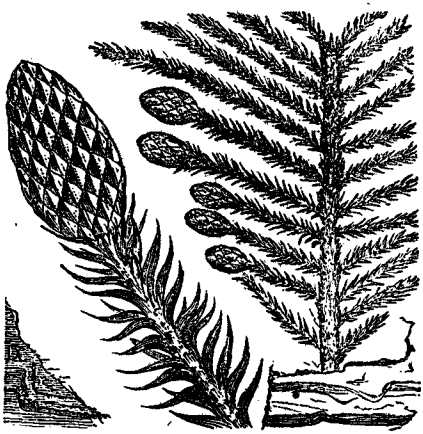
Wachendorfia.—A genus or monocotyledonous plants belonging to the nat. ord. *Hæmodoraceæ*, named after *Wachendorf*, a Dutch botanist. *W. thyrsifolia*, a native of Cape of Good Hope, has smooth leaves, a close, oblong panicle of flowers of a fine golden colour, and a saffron root. Probably the Wachendorfias, like the generality of the hæmodoraceæ, may yield a matter useful in dyeing.

Wacke.—A name introduced from the German, and applied to a mineral substance, which is an earthy variety of plutonic rocks, and in its composition bears a considerable resemblance to basalt. It is soft, but becomes hard by long exposure, and is of a greenish-gray colour. It often contains crystals of hornblende and mica.

Wagnerite.—A mineral named after *Wagner* of Munich. It is a fluo-phosphate of magnesia, and is composed of phosphoric acid, hydrofluoric acid, magnesia, oxide of iron, and oxide of manganese. It is of a honey-yellow colour, is translucid, and has a vitreous fracture. Specific gravity, 3·15; hardness, 5. Found at Werfen, in Salzbourg, in small veins of quartz, traversing an argillaceous schist.

Wahlenbergia.—A genus of dicotyledonous plants belonging to the nat. ord. *Campanulaceæ*, and named after *Wahlenberg*, a botanist. The species were at one time all included in the genus *Campanula*. They are numerous, upwards of 100 having been described. They are for the most part annual, herbaceous plants, rarely perennial, the greater number growing at the Cape of Good Hope, though others are found in the northern hemisphere also. The leaves are generally alternate, most frequently lying close set at the base of the stalk, and the flowers in the greater number are on long peduncles, which, when in bloom, hang down, but when in fruit, stand erect. The ivy-leaved Wahlenbergia, *W. hederacea* (= *Campanula hederacea*), is a species which has a widely extended range of habitat. It is a native of Great Britain and Ireland, the west of Europe, and North America.

Walchia.—A genus of fossil plants belonging to the coal formation? It is allied to *Lycopodium*. We have here introduced a woodcut of two species, *W. schlotheimii* and *W. hypnoides*, which will well illustrate the genus.



Wachendorfia schlotheimii and *W. hypnoides*.

Warneria = Hydrastis.—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*. The only species of the genus, *W. Canadensis*, is known in Canada by the name of yellow root. It is a small, perennial plant, with tuberous roots, and its fruit is like that of the raspberry. It is a native of North America, in watery places, and its root gives out a beautiful yellow colour, which is made use of for dyeing.

Wavellite.—A mineral named after *Dr. Wavel*, who first discovered it. It is a hydrous diphosphate of alumina, and is composed of alumina, phosphoric acid, and water. It is found in the form of slender needles in clay slate at Barnstaple, in Devonshire; near Cork; Brazil, Mount Vesuvius, &c. Specific gravity, 2·337; hardness, 3·5.

Websterite.—A mineral named after *Dr. Webster*, who was the first to discover it. It is an earthy substance of a dull white colour, soft to the touch, and adheres to the tongue. It occurs in kidney-shaped masses, with a smooth

surface, and an earthy texture, resembling a good deal chalk in appearance. It is composed of sulphuric acid, alumina, and water. It occurs exclusively in tertiary formations, and was first discovered at Newhaven, in England.

Weinmannia.—A genus of dicotyledonous plants belonging to the nat. ord. *Saxifragaceæ*, sub-order *Cunonieæ*, and named after a botanist of the name of *Weinmann*. It is composed of about forty-five species, natives of South America and the Mauritius, &c. They are trees or shrubs, with opposite, simple or pinnate, and stipulate leaves, and flowers arranged in axillary bunches. The bark of most of these plants abounds in tannin, and it is in consequence used for tanning hides. In Peru the natives mix the bark of some of the species with the cinchona bark, for the purpose of adulteration. *W. tinctoria*, a native of the Isle of Bourbon, is called by the natives tan rouge, and is used by them for dyeing a red colour. Another species, which grows in Madagascar, is a great favourite with bees, and is said to impart an exquisite flavour to the honey.

Wellingtonia.—A genus of gymnospermous

Wellingtonia gigantea.

dicotyledonous plants belonging to the nat. ord. *Coniferæ*. *W. gigantea* is an evergreen tree, a native of California, lately discovered by Mr. Lobb. It is a native of a solitary district on the elevated slopes of the Sierra Nevada, at an elevation of 5,000 feet above the level of the sea. This monarch of the forests of California varies in height from 250 to 320 feet, and from ten to twenty in diameter. A specimen, 300 feet high, was found to measure, including the bark, twenty-nine feet two inches in diameter, at five feet from the ground. The bark was from twelve to fifteen inches in thickness, the cones were 2½ inches long; and, judging from the number of concentric rings in the wood, its age was calculated at 3,000 years. At San Francisco, twenty-one feet of the bark, after the tree was felled, were stript from the lower part of the trunk, and put up erect. It formed a spacious carpeted room, containing a piano, with seats for forty persons; and on one occasion a party of 140 children were admitted inside without inconvenience. It may now be seen at the Crystal Palace, Sydenham. This plant is a very different one from that for which the name *Wellingtonia* was proposed by Meisner. It is only a synonym of *Meliosma*, belonging to the nat. family *Sapindaceæ*.

Werdlandia (named after *Werdland*, a botanist).—A genus of dicotyledonous plants belonging to the nat. ord. *Rubiaceæ*, sub-order *Cinchoneæ*, formed to receive several species of the genus *Rondeletia*, which differ from the others of that genus by the calyx having five very short teeth, &c. They are trees or shrubs, which are natives of the East Indies, and about thirty species have been described. One of the most remarkable is *W.* (*Rondeletia*) *tinctoria*, a native of Bengal. The bark is used by the natives for dyeing.

Wernerite.—A mineral named after the celebrated *Werner*. It is composed of silica, alumina, and lime. Specific gravity, 5·5; hardness, 2·7. It has a vitreous appearance, a lamellar texture, and occurs in the form of crystals. It is chiefly found in Sweden and Norway in the iron mines.

Wettinia.—A genus of plants belonging to the nat. ord. *Pandanaceæ*, remarkable as forming a sort of transition to the great ord. *Palmæ*. The species upon which the genus is founded, *W. Pœppigii*, is a tree which resembles very much the appearance of a palm tree. Its stem is about thirty feet high, but very slender, and terminates in pinnated leaves, about five feet long. It grows abundantly in the mountainous forests of Peru.

Wheelera.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and named after a botanist of the name of *Wheeler*. It contains a species which is a native of the West Indies, and is sent to this country under the name of American ebony. The wood is very hard, of a brownish-green colour, bears a

fine polish, and is much employed by cabinet and musical instrument makers.

Willughbya.—A genus of plants. See APOCYNACEÆ.

Winteraceæ.—A nat. ord. (or, according to some botanists, a sub-order of *Magnoliaceæ*) of dicotyledonous plants, and deriving its name from the genus *Wintera*, now a synonym of *Drimys*, and chiefly remarkable for containing the plant which yields winter's bark, *Drimys Winteri*. This tree is from six to forty feet in height, and was found in the Straits of Magalhaens, by Captain Winter, in 1579, who employed it as a remedy for scurvy, which had attacked his ship's crew. See MAGNOLIACEÆ.

Wistaria.—A genus of dicotyledonous plants belonging to the nat. ord. *Leguminosæ*, and named after Professor Caspar Wistar of Pennsylvania. The species belonging to this genus are deciduous, twining shrubs, natives of North America, Japan, and the north of China. They thrive well in this climate, have sweet-smelling flowers, and form great ornaments to our gardens. *W. Chinensis* is a magnificent shrub, which, in the month of April, is covered with a great profusion of large, odoriferous flowers. *W. frutescens* is a fine species from North America, growing in Carolina, Virginia, and Illinois. The flowers are of a violet hue, and it is cultivated in European gardens.

Withamite.—A mineral named after *Mr. Witham*. It occurs in the form of small crystals, in drusy cavities in trap rocks, and is found at Glencoe, in Scotland. The crystals are of a red colour, or pale straw-yellow, translucid, and very shining. Specific gravity, 3·137; hardness, 6.

Witheringia.—A genus of dicotyledonous plants belonging to the nat. ord. *Solanaceæ*, and named after *Dr. Withering*. The species originally belonged to the genus *Solanum*, but have of late been separated from it on account of a difference in the inflorescence. About twenty species are described, of which one is more particularly deserving of notice. This species, *W. (Solanum) montana*, is a native of Peru, in the mountainous region of Lima and Chancay, where it is known under the name of papa de loma. It is an herbaceous plant, rough with hairs, the leaves oval, obtuse, heart-shaped, and having tuberous roots, like the potato. These tubers are used by the Peruvians as an article of food for themselves, and as a means of fattening pigs.

Wolfram (derived from the two German words, *rahm*, froth; and *wolf*, a wolf).—A mineral substance, synonymous with *tungstate of iron*. See TUNGSTEN.

Wollastonite (named after the chemist *Wollaston*). *Table Spar.*—A mineral found in crystals or small prismatic masses, disseminated through the older crystallized rocks, and in some of the more modern lava of volcanoes. It is white, glassy, brittle, and is composed of lime and silica. It has been found in Hungary, in Finland, in Italy, on Vesuvius, and on the Castle Hill, Edinburgh. Specific gravity, 2·8; hardness, 4·5.

Wrightia.—A genus of plants named after *Dr. W. Wright*. See APOCYNACEÆ.

X

Xanthite.—A mineral substance found at Amity, Orange County, New York, and composed of silica, lime, alumina, oxides of iron and manganese, and magnesia. It occurs in rounded grains or foliated masses, of a yellow colour, and translucent. Specific gravity, 3·221; hardness, 2.

Xantho (ξανθος, yellow).—A genus of *Crustacea*, belonging to the section *Podopthalmi*, order *Decapoda*, and division *Brachyura*. The species are numerous, and are found distributed through most seas. The carapace is very wide, and slightly convex. In some it is tuberculous on the upper surface, and in others it is granular. *X. rivulosus* may be taken as the type, and is found in the Mediterranean. *X. floridus* is common on the English and French coasts, is about two inches in length, and of a reddish colour, with black claws.

Xanthophyll (ξανθος, yellow; φυλλον, a leaf).—A principle in vegetables which gives the leaves their yellow colour in autumn. As light decreases at that season of the year, the chlorophyll, upon which their green colour depends, diminishes, and is probably altered by the loss of a portion of carbon. Its place is then taken by xanthophyll.

Xanthorrhœa (ξανθος, yellow; ῥεω, to flow). *The Grass Tree.*—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*. The species are indigenous in Australia, and give a peculiar feature to the vegetation of that country. Sometimes they rise to a considerable height, at other times the stems are short, but they are always covered with a layer of resinous matter. The leaves are numerous, long, and linear, very close set, and slightly enlarged at their base, which is sheathing. From the centre of the mass of leaves rises a long, terminal spike of flowers, fixed in a stalk of equal length. The two together are about from four to six feet in length, and resemble somewhat a largely developed spadix of *Typha latifolia*. These plants are remarkable for the disposition of the fibro-muscular bundles which characterize the monocotyledonous plants. The resin which is found in them is known by the name of Botany Bay resin, is of a reddish-yellow colour, inodorous, and very analogous in appearance to gamboge. It has an acrid taste, and when burnt exhales

the odour of benzoin. The principal portion of the resin brought to this country is the produce of *X. hastilis*. Physicians in Australia employ it in the cure of diseases of the chest, and the natives mix it, when melted, with earth, and make a sort of mastic of it, which they employ to caulk their boats and fasten their weapons.

Xanthorizn(ξανθος, yellow; ριζα, root).—A genus of dicotyledonous plants belonging to the nat. ord. *Ranunculaceæ*, and containing only one species, *X. apiifolia*, a shrub which grows in North America. It is commonly known by the name of yellow root. The bark is intensely bitter, and is used in America as a tonic, though the plant has also acrid properties.

Xanthoxylaceæ.—A nat. ord. of dicotyledonous plants, composed of trees or shrubs, with exstipulate, alternate, or opposite leaves, having pellucid dots. The flowers are either axillary or terminal, and coloured gray, green, or pink. The greater number are natives of the tropical parts of America, and the species are rather numerous, upwards of 110 having been described. Most of them yield a volatile oil, which is aromatic and pungent. Some are diaphoretic in their properties, others are febrifugal and tonic. The bitter principle secreted by many of these plants is called *Xanthopicrine*. The genus *Xanthoxylum* is the type of the family, and gives it its name. The pungency of some of the species of this genus has caused them sometimes to be denominated peppers. *X. fraxineum*, the prickly ash, a tree fourteen or fifteen feet high, with leaves closely resembling those of our common ash tree, and a native of North America, from Canada to Virginia, is called the toothache tree. The bark and fruit have a hot, acrid taste, and when taken into the mouth act as a sialagogue, producing an increased flow of saliva. A tincture of the bark is recommended in cases of rheumatism. *X. Clava-Herculis* is a native of the West Indies, and obtains its specific name from its knotty, spinous stem. From the colour of the wood, it is called the yellow wood of the West Indies. The fruit and seeds are very fragrant. The bark is bitter, and is used by the natives as an astringent and stomachic.

Xanthoxylum (ξανθος, yellow; ξυλον, wood).—See XANTHOXYLACEÆ.

Xema.—A genus of gulls. See LARIDÆ.

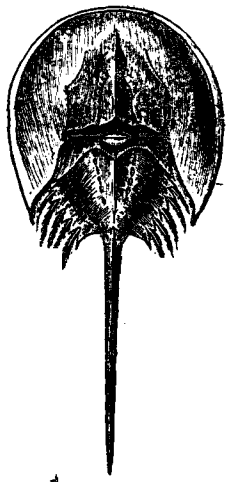
Xenos (ξηνος, without a foot).—A genus of insects belonging to the order *Strepsiptera*, the larvæ of which live parasitic upon wasps, &c. *X. vesparum* is the species most commonly found, a little more than a line in length, the body black, the wings of a dirty white, and blackish-brown feet. It is common in the south of Europe.

Xeranthemum (ξηρος, dry; ανθεμον, a flower).—A genus of dicotyledonous plants belonging to the nat. ord. *Compositæ*, sub-order *Cynaraceæ*. The five or six species of which this genus is composed are herbs, growing in the south and east of Europe. Their leaves are linear or oblong, entire and cottony underneath. The flowers are in terminal, solitary heads, of a white or rosy colour, and have an involucre formed of several rows of dry, coloured, imbricated scales. *X. radiatum* is a species which grows on the dry hills in the centre and south of France. The scales of the involucre are whitish, rayed or washed with red or purple. They form a kind of flower, of the kind known as "immortelles" in France; and when the scales become faded, the colour is easily restored, by submitting them to the vapour of an acid.

Xiphias (ξιφος, a sword). *The Sword-fish.*—See SCOMBERIDÆ.

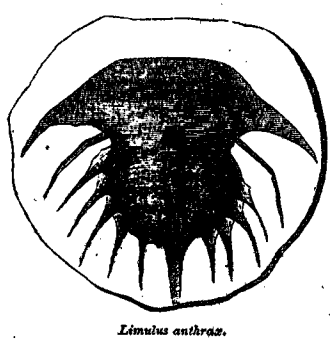
Xiphosura (ξιφος, a sword; ουρα, a tail). *Sword-tails.*—A sub-class of division of *Crustacea*, allied to the *Entomostraca*. They are distinguished from all the other crustacea by the peculiar formation of the mouth. Instead of having mandibles and jaws, as the others have, the masticatory organs are the six pairs of thoracic feet, which are so situated as to surround the mouth. The basal portion of these members is armed with strong spines, which serve the purpose of teeth, and thus replace the ordinary organs for masticating the food. The branchiæ are in the form of numerous plates or membranous folds, placed transversely, lying one upon the other, like the leaves of a book, and attached to the basal portion of the abdominal legs. The body of these animals is composed of three parts; the head and thorax united in one (*cephalo-thorax*), the abdomen, and tail. The cephalo-thorax is covered by a large horny buckler, of a semicircular form, and on it we see four eyes, two very small and simple, and two larger, compound, and of an oval shape. The abdomen is covered also with a considerable sized buckler, of a somewhat triangular shape, toothed at the sides, and sending off from its lower edge a long, sharp spine, nearly as long in general as the whole body, and constituting the tail. The thoracic legs are six pairs in number, in the female all terminated by a double claw, serving both as organs of motion, prehension, and mastication. The abdominal legs are also six pairs, foliaceous in structure, and serving the purpose of swimming and respiration. The nervous system consists of a principal medullary mass, which surrounds the œsophagus like a ring, giving off nerves to the parts belonging to the head and thorax, and a large cord, which extends from this downwards along the median line of the abdomen, sending off nerves to the abdominal regions and the tail. There is only one genus belonging to the *Xiphosura*, the genus *Limulus*, or king crab. Some of the species of *Limulus* are very large, occasionally attaining the length of two feet. They are all marine, inhabiting the seas of India, China, Japan, and the coasts of North America. They seem to prefer living on sandy shores; and in order to avoid the great heat of the sun, which proves fatal to them, they bury themselves in the

mud. The young undergo considerable changes in their progress to maturity; for at first they



Limulus polyphemus—King Crab.

have no tail, their abdominal buckler is rounded posteriorly, and the sixth pair of abdominal feet are undeveloped. The male is distinguished from the female by the first and second pairs of thoracic feet being swollen and destitute of the didactyle claw. The long tail of one of the species from



Limulus anthrax.

the Moluccas is used by the natives as a point for their arrows, and the wounds caused by them are said to be dangerous. In America the large shells are used by the inhabitants to lade water with, and the animals themselves are used to feed pigs. In China the eggs are used as food by the natives, and in Japan a species is figured in their primitive zodiac as the representative of the constellation Cancer. Several fossil species are known and described. They are found in the lithographic stone of Solenhofen, in the mussel-chalk formations of Germany, and in the carboniferous system in Shropshire and Ireland, as *Limulus anthrax*, &c.

Xylocopa (ξυλον, wood; κοπτω, to cut). *The Carpenter Bee.*—See APIDÆ.

Xylophaga (ξυλον, wood; φαγω, to eat).—A genus of conchiferous *Mollusca* belonging to the family *Pholadidæ*. Two species are known, burrowing in wood. They bore an inch deep, and across the grain, in floating wood and timbers which are always covered by the sea. The shell is globular, gaping in front, closed behind, and the animal is included within the valves, there being no calcareous tube. The burrows, however, which they make, are lined with shell.

Xylophagi (derivation as in word above). *Wood-eaters.*—A tribe of insects belonging to the order *Coleoptera*, composed of several small families of beetles, the species of which are, many of them, more or less destructive to wood. See BOSTRICHUS, CUCUJIDÆ, SCOLYTUS.

Xylophili (ξυλον, wood; φιλεω, to love).—A family of beetles. See SCARABÆIDÆ.

Xylopia (ξυλον, wood).—A genus of plants. See ANONACEÆ.

Xyrichthys (ξυρος, a razor; ιχθυς, a fish). *The Razor-fish.*—A genus of acanthopterygious fishes belonging to the family *Labridæ*. They present an extremely compressed shape of body, and the forehead is high; so that at one time they were arranged with the *Coryphenæ*. Their bodies, however, are covered with large scales, and their jaws are furnished with conical teeth, largest in the centre. The species are found in the Mediterranean and also in the southern seas, and the flesh of some is much esteemed. *X. cultratus* is the type, a native of the Mediterranean, and commonly known by the name of the razor-fish.

Xyridaceæ.—A nat. ord. of monocotyledonous plants, composed of herbs having a sedge-like aspect, with radical leaves and scaly flowers. They are natives generally of the tropical regions of America, Asia, and Africa. *Xyris indica*, a native of America, is said to be used as a remedy in itch and leprosy.

Yetus (Υης, Jupiter).—A genus of gasteropodous *Mollusca* belonging to the family VOLUTIDÆ.

Yponomeuta (υπονομευω, to hollow out).—A genus of insects belonging to the order *Lepidoptera*, tribe *Nocturna*, and family *Yponomeutidæ*, of which it forms the type. The species are characterized chiefly by the fore wings being long and convoluted when at rest, and the posterior large, and the border fringed. The body is slender and elongated. They are generally of a white or slate colour, with black spots, whence they are often called small ermine moths. The caterpillars are glabrous, attenuated at both extremities, of a slate colour, scattered all over with black dots. These moths live chiefly on shrubs, in large societies, under a common web, in the midst of which they change into the chrysalis state, each in its own cocoon. About a dozen species are described as natives of Europe, several of which cause great destruction to fruit trees. *Y. cognatella* is a species which destroys the apple trees; and in some seasons, as was the case in the year 1838, is the cause of great loss to this crop in Normandy. They appear sometimes very suddenly, generally with a strong north-west wind, and multiply exceedingly. The great numbers which at times make their appearance are remarkable, and after devouring all the leaves, may be seen hanging in enormous bunches, more than two feet long, and thick in proportion, the larvæ being enveloped in a white silky web, which covers the whole trunk of the tree. *Y. padella*, a little moth, with the upper part of the wings of a livid white colour, with three rows of black points, the under surface leaden coloured, and with a white fringe, is the source of great mischief to cherry trees.

Yttria.—An earth composed of oxygen and a metal called *Yttrium*. It was discovered, in 1794, at Ytterby, in Sweden, and was first called Ytterbite, but has since been named gadolinite, after Gadolin, its original discoverer.

Yttrocerite. *Fluate of Yttrium.*—See FLUORIDES.

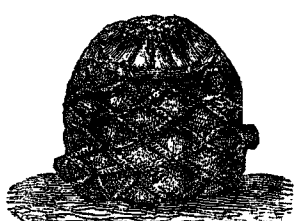
Yucca. *Adam's Needle.*—A genus of monocotyledonous plants belonging to the nat. ord. *Liliaceæ*. The species which constitute this genus are natives of tropical America and the warm parts of North America. They are handsome plants, sometimes with an arborescent stem, have stiff, thick, narrow, lanceolate leaves, with strong spines on their edges, collected in a large bunch at the base. The flowers form a beautiful terminal panicle. About twenty-two species are known, several of which are now cultivated in our gardens. Amongst them the best known, perhaps, is *Y. gloriosa*, the common Adam's needle, a fine plant, growing ten or twelve feet high, and a native of America, extending from near Canada to Peru. It possesses long, lanceolate leaves, sharp at the point, entire at the edges, and a magnificent panicle of white flowers. It

Panicle of *Yucca gloriosa*.

grows well in the open air in this country, but seldom rises to a greater height than three or four feet.

Yunx. *The Wryneck.*—A genus of birds belonging to the order *Scansores*, family *Picidæ*, and forming the type and single genus of a small sub-family, *Yuncinæ*. The genus is characterized by the bill being short, straight, and depressedly conical. The nostrils are basal, naked, and partly closed by a membrane. The tongue is long and vermiform, with a horny point. The two anterior toes are joined together at their origin, the two behind unconnected. The common wryneck, *Y. Torquilla*, is about seven inches long, and is of a rusty-ash colour, irregularly spotted and speckled with brown and black. Though in many respects nearly allied to the woodpeckers, it never associates with them. It is a summer visitant of Great Britain and many other parts of Europe, and takes up its abode for the winter in North Africa and the warmer parts of Western Asia. In England it may be looked for immediately after the cuckoo is heard, and this so regularly, that it is often called the cucko's mate, maid, or fool. The food of the wryneck consists of insects, especially ants and their eggs, for obtaining which its long, protrusive and retractile tongue is well adapted.

Zamia.—A genus of gymnospermous dicotyledonous plants belonging to the nat. ord. *Cycadaceæ*. The species of this genus are trees, with a single cylindrical trunk of moderate height, pinnate leaves, and flowers in tesselated catkins. They are natives of the tropical parts of America and Asia, and are found also at the Cape of Good Hope and Australia. *Z. spiralis* is a native of New South Wales. The cone is about half the size of a man's head, and composed of nuts about the size of a chestnut. These nuts are eaten by the natives of Australia, and their flavour is not unlike that of chestnuts. *Z. cycadis*, the bread-tree zamia, is a native of Southern Africa. The stem is thick and scaly, and attains a height of six or seven feet. The pith of the old stems is collected by the Kaffres and Hottentots, tied up in the skin of a sheep or calf which has been well rubbed with grease, and then buried in the ground. After remaining there till it becomes putrefied, it is taken up and bruised between two stones, and then formed into little cakes about an inch in thickness. These are baked in wood ashes, and are esteemed by these people as a great luxury. *Z. pungens* is another Cape species, and a figure of it is given at p. 186. From *Z. pumila*, a native of the West Indies, an amylaceous matter is procured, which is sometimes sold as arrow-root. Many representatives of this genus occur in a fossil state. Some closely



Mantellia nidiformis, from the Portland Dirt-bed.

resembling it are placed in the genus *Zamites*, and some others nearly allied in the genus *Mantellia*.

Zanclus.—A genus of acanthopterygious fishes belonging to the family *Chætodontidæ*. There are only two species known, distinguished by their body being of an obliquely rhomboidal shape, covered with very small scales. The muzzle is projecting and tubular. The spinous rays of the dorsal fin are much graduated, and the third or fourth spine has a long filamentous tip like a whip thong. They have brush-like teeth in the jaws, but none on the palate. *Z. cornutus* is a widely diffused species, occurring both in the Indian and Pacific Ocean. From its singular form, and its having a long horned front, it has become an object of almost superstitious reverence among the fishermen of the Moluccas. It is said when they happen to capture an individual, they immediately salute it by certain genuflexions, and then cast it into the sea. It attains a weight of 15 lbs., and is considered a very excellent eating fish, resembling in flavour the turbot.

Zanthoxylum.—See XANTHOXYLUM.

Zapornia.—A genus of birds belonging to the order *Grallæ*, and family *Rallidæ*. The principal species is the spotted crake, or speckled water hen, *Z. porzana*, a native of several parts of continental Europe, and a summer visitor of Great Britain. In France this bird is highly esteemed for the flavour of its flesh; and indeed few, if any, of the aquatic birds, or even of any others, can match it in autumn as a rich morsel for the table.

Zea. *The Maize.*—A genus of monocotyledonous plants belonging to the nat. ord. *Gramineæ*, the grasses. There are only two species known, both of which are exclusively American. *Z. Mays* is the Indian corn, or common maize, and is cultivated very extensively in America, and most of the countries in southern Europe, but does not ripen well in northern latitudes. As an article of food it is of great importance in America and other parts of the world, and is said, since the failure of the vines in the island of Madeira, to be rapidly supplying their place, and already to be affording a great part of the food of the natives. *Z. curagua*, the Chili maize or Valparaiso corn, is a smaller plant than the other, and is a native of Chili. The grains, when roasted, are said to split into the form of a cross, and are hence regarded by the natives with a kind of religious veneration.

Zeidæ.—A family of acanthopterygious fishes nearly related to the *Scomberidæ*. Their bodies, however, are very high and compressed, and the mouth has a few small erect teeth. The scales are very small and satin-like. They have either one single dorsal fin, or one so deeply divided as to appear like two. The genus *Zeus* is the type of the family, and contains one or two remarkable species. One of these is the well known John Dory, *Z. faber*. The dory is a fish of considerable size, of a compressed form, with a short tail, and a somewhat grotesque aspect. It has a metallic lustre, is of a gray colour traversed with yellowish bands, and has a black mark on each side, on the anterior part of the back. This fish, in common with the haddock, is popularly believed to be the one which St. Peter took by command of our Saviour, and contained the piece of money required for paying the tribute. The two black marks are said to be the marks of St. Peter's thumb and finger. In some places it is

called "sea chicken," and in the Bay of Biscay, and the coasts of the Mediterranean, its names all bear a relation to its resemblance to a cock. "Dory," or "dorée," evidently refers to its yellow or golden colour. In Gascony it is called "jan," which signifies a cock, and, as Sir John Richardson suspects, its English name "John" is a corruption of this word, "John Dory" meaning, therefore, the "gilt cock" of the sea. The modern Greeks call it "Christo psaro," or Christ's fish, and hang it up in their churches. At the Canaries it is called "Gallo-San-Pedro," (St. Peter's cock). In Spain, Languedoc, and Sardinia, it is called "gal, gallo," and "gadda," all signifying cock, and having a relation to the resemblance which its dorsals bear to a cock's comb. The John Dory is a very delicate and excellent tasted fish. It owes its estimation for the table in this country to Quin the actor, who brought it into repute. The other species is the king-fish, or opah, *Zeus* (*Lampris*) *opah*, a superb fish, of brilliant colours, measuring between four and five feet in length, and sometimes weighing as much as 140 lbs. The skin is apparently destitute of scales, and perfectly smooth. The opah is an inhabitant of the seas of warm regions, but occasionally pays a visit to the coast of Great Britain.

Zeuglodon.—A genus of fossil cetaceous animals. It was first discovered in America by Dr. Harlan, who named it *Basilosaurus*. He considered it a reptile, but Professor Owen has pointed out its true relations, and shown its position to be in the cetaceous order of *Mammalia*. A nearly entire skeleton, about seventy feet in length, was discovered in 1843, in a marly limestone soil, in Alabama, and is now in New York. Remains of other species of the same genus of cetaceans have been found in different parts of America.

Zeus.—A genus of fishes. See ZEIDÆ.

Zinc.—A metal of a bluish-white colour, shining when fresh, but soon tarnishing by exposure to air. It has never been found native, but always combined with other substances. The ores are various, and are brought from different localities. The most common are sulphide of zinc, blende or black jack, calamine or carbonate of zinc, and the hydrous silicate of zinc. Most of the zinc made in Britain is obtained from the first kind, blende. This ore is found in great abundance in various parts of the world, both in primary and secondary formations, and either in veins or beds. It abounds in Cornwall, and several of the northern counties of England, and large quantities are met with and worked in Germany. Calamine is almost equally abundant, and is, next to blende, the one generally employed for procuring the metal. It is found in veins and beds in various parts of England, France, and America.

Zingiber. *Zinger.*—See ZINGIBERACEÆ.

Zingiberaceæ.—A nat. ord. of monocotyledonous plants, synonymous with *Scitamineæ* of some botanists. The species of which the family is composed are herbaceous, with, in general, a creeping or tuberous rhizome, rarely fibrous. The stem is sometimes very short, almost wanting, at other times more developed, simple, and formed by the cohering bases of the leaves. These are simple, flat, entire, and traversed by a strong median rib. The flowers are irregular, and disposed in form of a dense spike or raceme, or a sort of panicle, and spring from the axils of spathaceous, membranous bracteæ. They are natives of all parts of the intertropical zone, the greater number belonging to Asia, only a few being found in Africa and America. They are plants possessed of considerable beauty, and are mere or less aromatic, the principle to which they owe this quality residing for the most part in the rhizome, and seeds. Some are used in medicine as stimulants and stomachics, others as condiments, and some as perfumes. The genus *Zingiber* is the type of the family, and contains the plants well known under the name of *ginger*. *Z. officinalis*, the narrow-leaved or common ginger, is originally indigenous in the East Indies, but is now cultivated in almost all warm parts of the globe. The rhizome or rootstock of this plant is the ginger of commerce. It is imported in considerable quantity from the East and West Indies, and China. *Z. Zerumbet*, the broad-leaved ginger, is also a native of the East Indies, and is much used in the East for cataplasms and fomentations, but is not taken internally.

Zircon.—A mineral of a hard nature, infusible, insoluble in acids, with a vitreous, conchoidal fracture, and occurring in attached, imbedded, and loose crystals. It has an adamantine lustre, and of all the precious stones is the one whose specific gravity is the greatest, being 4·681. Hardness, 6·5 to 7·5; scratches quartz. Its base is the oxide of zirconia. There are two kinds of zircon, the jargon and the hyacinth. Jargon is either colourless, or is of a greenish-yellow, brown, green, or blue colour. The colours, however, are not lively. The crystals are generally small, and are found disseminated in crystallized rocks. Hyacinth is of a red or orange-brown colour, which, however, is destroyed by the application of heat. The crystals are of a lively, shining lustre, and are almost completely transparent. They are found disseminated in basaltic rocks, and also in the scoriæ and sand of extinct ancient volcanoes. They were first found in Ceylon, but since then have been found in France and Bohemia, and the United States of America. They are generally too small to cut.

Zizania.—A genus of grasses. *Z. aquatica* is the Canadian wild rice, and is a plant which grows in the waters of North America from Canada to Florida. The seeds afford a nutritious article of diet, and are eaten by the wandering tribes of North-West America. The water fowl also feed upon them.

Ziziphus.—A genus of dicotyledonous plants belonging to the nat. ord. *Rhamnaceæ*. The species are shrubs with alternate three-nerved leaves, spiny stipules, and a mucilaginous fruit, which is eatable. *Z. vulgaris*, the common jujube, is a native of Syria, but is now cultivated in many parts of the south of Europe for the sake of its fruit, which is called jujube. It is of a blood-red, or saffron colour, and has a sweet granular pulp. In Italy and Spain it is eaten when fresh, and in the winter season as a dry sweetmeat. It is a favourite with the Turks; the fruit is sold in great quantities in the markets of Constantinople, and the tree is planted in front of their cafés for the sake of its shade. *Z. Spina-Christi*, or Christ's thorn, is very spinous, with pliant branches, and being a not uncommon plant in Palestine, has been considered by some botanists to be the one of which the crown of thorns, placed upon our Saviour's head, was composed. Most authors, however, consider the plant used for that purpose to have been a species of *Paliurus*, *P. aculeatus*. See RHAMNACEÆ.

Zoantharia (ζωον, an animal; ἀνθος a flower). *Animal Flowers.*—A name given by some zoologists to a part of the great class *Zoophyta*, and corresponding to the *Anthozoa Helianthoidea* of other authors. In it are contained the actiniæ and corals. See ANTHOZOA and ACTINIIDÆ.

Zoarces.—A genus of acanthopterygious fishes belonging to the family *Blenniidæ* or blennies. The viviparous blenny, *Z. viviparus*, is an exception to the normal method of reproduction in fishes. As its specific name implies, it brings forth its young alive, and perfectly able to take care of themselves as soon as excluded. The body of this curious fish is elongated, covered with a mucous secretion, and the ventral fins assume the form and perform the functions of the legs of higher animals. It is said that it creeps up rocks out of the water, and is able to remain

Zoarces viviparus—Viviparous Blenny.

exposed to the air for some time without inconvenience. The bones become green when the fish is boiled, hence it is sometimes called green-bone.

Zoea.—The young state of some *Crustacea*. See CANCER.

Zoizite.—A mineral substance. See EPIDOTE.

Zonuridæ.—A family of reptiles belonging to the order *Saura*, or lizards, containing a considerable number of species, the great proportion of which are natives of South Africa and the warm parts of America. Little of interest is known of the habits of these animals. Some of the species are almost destitute of legs, and have the body snake-like. See PSEUDOPHUS.

Zoologia (ζωον, animal; λογος, discourse).—That branch of science which treats of the natural history of all animated beings comprised in the term animal kingdom.

Zoophaga (ζωον, animal; φαγω, to eat).—A general term signifying creatures that subsist upon other animals; but now more properly restricted, as a zoological term, to signalize a particular group of molluscous animals, which are animal feeders, and distinguished from the *Phytophaga*, or vegetable feeders.

Zoophyta (ζωον, animal; φυτον, plant). *Zoophytes.*—A class of inferior animals, composed in great part of plant-like substances, which have often been mistaken for true marine vegetables, but which are now known to be formed by polyps. See ANTHOZOA and BRYOZOA.

Zoospores (ζωον, animal; σπορα, seed).—A name given to a group of minute *Algæ*.

Zootica.—A genus of lizards. See LACERTINIDÆ.

Zorilla. — The Cape pole-cat. See MUSTELIDÆ.

Zostera. — A genus of plants. See NAIADACRÆ.

Zygæna.—The hammer-headed shark. See SQUALIDÆ. Also a genus of lepidopterous insects, which, though resembling moths in general aspect, fly during the day, and in full sunshine.

Zygnema (ζυγον, a yoke; νημα, a thread).—A genus of acotyledonous plants belonging to the nat. ord. *Algæ*, tribe *Confervaceæ*. Several species are British, and are found in our fresh water ditches.

Zygodactyli (ζυγος, a pair (from ζευγνυω, to join); δακτυλος, finger).—An order of birds in the arrangements of some ornithologists, and synonymous with the order *Scansores*.

Zygophyllaceæ. *The Guaiacum family.*—A nat. ord. of dicotyledonous plants, composed of herbs, shrubs, or trees, with opposite, stipulate, usually compound leaves, not dotted, and hermaphrodite flowers. They are natives of various parts of the world, chiefly of warm, extra-tropical regions, as in the south of Europe, America, Africa, and India. Some of the plants belonging to this family abound in a stimulant resin, which pervades the wood and bark; others are bitter and acrid. The genus *Zygophyllum* contains several species, known by the name of bean-capers. *Z. fabago*, the common bean-caper, derives its name from the flowers being used as a substitute for capers. It is said to have vermifuge qualities. It is a common herbaceous plant in our gardens, and was cultivated in England by Gerarde as early as 1596. This family also contains the tree which yields the gum resin known as gum guaiacum, and the wood of which is the *lignum vitæ*, and so highly prized for its hardness. See GUAIACUM.

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Ambulacra.—The perforated series of plates in the shell of the *Echini* or sea urchins.
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American aloe. *Agave.*
Amorphous (α, privative; μορφη, form).—Without regular figure.
Amygdaline.—The bitter azotised principle of the bitter almond. *Amygdaleæ.*
Anaconda. *Boidæ.*
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Anchovy pear. *Grias.*
Androgynous.—The combination of both male and female organs in the same body.
Angel fish. *Squalidæ.*
Angiospermous (αγγος, a vessel; σπερμα, seed).—A division of flowering plants, the seeds of which are enclosed in a seed-vessel.
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Annual.—A term applied to a large division of plants, importing that the seed germinates, and that the plant produces leaves and flowers, ripens its seeds, and perishes within twelve months.
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Anoplura (ανοπλος, unarmed; ουρα, tail).—A class of insects containing the lice, and so called from their having no bristles at their tails; to distinguish them from the *Thysanura*, or springtails.
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Apetalous (α, priv.; πεταλον, leaf).—Plants in which the whorl of the petals is wanting, are called *Apetalous.*
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Apple. *Pomaceæ.*
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Avocado or alligator pear. *Laurus.*
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Axillary.—In plants the upper angle formed by the leaf with the stem is called the *axil*, and everything arising at that point is called *axillary*. It is there that leaf-buds are usually developed.
Axis.—In Conchology, the imaginary line round which the whirls of a spiral shell revolve.
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Barbadoes gooseberry. *Cactaceæ.*
Barbel. *Cyprinidæ.*
Barbels.—The same as barbules.
Barberry. *Berberidaceæ.*
Barbet. *Bucco.*
Barbules.—Filamentous appendages, or little barbs, attached to the mouths of certain fishes.
Bark bread.—A kind of bread prepared by the inhabitants of Norway, from the inner bark of *Pinus sylvestris.*
Bark, false. *Exostemma.*
Bark, Peruvian. *Cinchona.*
Barley. *Hordeum.*
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Bast or bass.—The inner bark of the lime tree, from which Russia mats are manufactured.
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Bastard ipecacuanha. *Pedilanthus.*
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Ben (oil of). *Moringa.*
Bent-grass, or upright lime grass. *Elymus.*
Benzoin. *Styraceæ.*
Bergamot. *Aurantiaceæ.*
Betel nut. *Areca.*
Betle pepper. *Piperaceæ.*
Bhang. *Cannabinaceæ.*
Biennial.—Plants which germinate and produce leaves the first year, but do not produce a flowering stem nor ripen their seeds, till the second, after which they perish.
Bifid.—Divided by having a deep notch down the centre, opening with a cleft.
Bifurcated.—Divided into two prongs or forks.
Bikh (an Indian poison). *Aconitum.*
Bilberry. *Vaccinium.*
Bindweed. *Convolvulaceæ.*
Binturong. *Arctictis.*
Biped.—An animal having two feet, as man.
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Bitter cress. *Cardamine.*
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Black perch. *Centropristes.*
Bladder nut. *Staphyleaceæ.*
Bladder senna. *Colutea.*
Bleak. *Leuciscus.*
Blight.—A disease in plants, caused by fungi. *Thallogenæ.*
Blind lizard. *Typhlops.*
Blind mole-rat. *Spalax.*
Blind-worm. *Anguis.*
Blister-fly. *Cantharidae.*
Blood flower. *Amaryllidaceæ.*
Blood-root plants. *Hæmodoraceæ.*
Blubber.—The fat of whales and other large marine animals, from which train oil is made, and which lies in a thick layer under the skin.
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Bramble. *Rubus.*
Brazil nuts. *Bertholletia.*
Brazil wood. *Cæsalpinieæ.*
Bread fruit tree. *Artocarpaceæ.*
Bread root. *Psoralea.*
Bream. *Bramidæ* and *Cyprinidæ.*
Breccia.—A rock composed of unworn fragments cemented together. It is an Italian word, and corresponds to the "brockram" of the Cumberland miners.
Breeze-flies. *Tabanidæ.*
Brill. *Pleuronectidæ.*
Brine shrimp. *Artemia.*
Bristly shrew. *Gymnura.*
Brocoli. *Brassica.*
Brome grass. *Bromus.*
Brooklime. *Veronica.*
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Brown linnet. *Fringillinæ.*
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Buffalo. *Bovecæ.*
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Bullfinch. *Pyrrhulinæ.*
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Bunt.—A disease attacking the seed of the wheat, and caused by a minute fungus. *Thallogenæ.*
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Burgundy pitch. *Abies.*
Burnet. *Poterium* and *Sanguisorba.*
Burrow.—An excavation in the ground, made by various animals as a dwelling for themselves, or a place to deposit their stock of provisions.
Bustards. *Otidæ.*
Butcher birds. *Laniidæ.*
Butter-burr. *Petasites.*
Buttercup. *Ranunculus.*
Butterflies. *Lepidoptera* and *Papilionidæ.*
Butterfly weed, the same as tuberous swallow-wort. *Asclepiadaceæ.*
Butter of cacao. *Theobroma.*
Butter of Canara. *Dipterocarpaceæ.*
Butter tree. *Bassia.*
Buzzard. *Buteoninæ.*

Cabbage. *Brassica.*
Cabbage butterfly. *Pieridæ.*
Cabbage garden pebble moth. *Pyralis.*
Cabbage palm. *Euterpe.*
Cabbage tree. *Geoffroya.*
Cacao. *Theobroma.*
Cachalots. *Catodontidæ.*
Cad-bait. *Phryganeidæ.*
Caddice-flies. *Phryganeidæ.*
Caddice worm flies. *Trichoptera.*
Cafeine.—The active principle of coffee. *Coffea.*
Cairngorum. *Quartz.*
Cajeputi. *Melaleuca.*
Calaba tree. *Calophyllum.*
Calabash tree. *Bignoniaceæ.*
Calamary. *Loligo.*
Calling hare. *Lagomys.*
Calumba—same as colomba. *Cocculus.*
Camel. *Camelus.*
Cameleopard. *Giraffina.*

Campagnol. *Murina.*
Campanulate.—Plants with the corolla shaped like a bell are called campanulate or bell-shaped.
Campeachy wood. *Hæmatoxylon.*
Camphor. *Camphora.*
Camphor tree. *Camphora.*
Canadian balsam. *Abies.*
Canadian wild rice. *Zizania.*
Canaliculate.—Channelled or grooved.
Canary bird. *Fringillinæ.*
Canary grass. *Phalaris.*
Candle-berry. *Myrica.*
Cane. *Arundo.*
Cannon ball tree. *Lecythideæ.*
Canoe birch. *Betula.*
Cape mole. *Chrysochloris.*
Cape pigeon. *Procellarinæ.*
Capercailzie. *Tetraonidæ.*
Capers. *Capparidaceæ.*
Caper spurge. *Euphorbiaceæ.*
Cape tulip. *Hæmanthus.*
Capillaire.—A syrup prepared from a species of fern. *Acrogenæ.*
Capped apes. *Presbytina.*
Capsicine.—An active principle. *Capsicum.*
Capuchin's beard. *Cichorium.*
Capuchin monkey. *Pithecia.*
Capybara. *Hydrochærus.*
Caracal. *Felinæ.*
Caracaras. *Polyborinæ.*
Caramuru. *Lepidosiren.*
Caraway. *Carum.*
Carboniferous.—Specially yielding coal.
Carboniferous fossils.—Fossils belonging to the carboniferous system, or the coal measures.
Cardamoms. *Elettaria.*
Carding bees. *Anthidium.*
Cardoon. *Cynaraceæ.*
Carline thistle. *Carlina.*
Carnahuba palm. *Corypha.*
Carnation. *Caryophyllaceæ.*
Carob tree. *Ceratonia.*
Carolina pink root. *Spigelia.*
Carp. *Cyprinidæ.*
Carrageen moss, a species of sea-weed. *Thallogenæ.*
Carrier shells. *Phorus*
Carrion flower. *Stapelia.*
Carrot. *Daucus.*
Cascarilla. *Croton.*
Cashew nut. *Anacardiaceæ.*
Cassia. *Cathartocarpus.*
Cassia bark. *Cinnamomum.*
Cassowary. *Struthionidæ.*
Cassowary tree (same as beef-wood). *Casuarinæ.*
Castor oil. *Ricinus.*
Catch-fly. *Silene.*
Catechu. *Nauclea.*
Cat family. *Felinæ.*
Catkin. *Amentaceæ.*
Catkin-bearing plants. *Amentaceæ.*
Cat mint. *Calamintha* and *Nepeta.*
Cat's eye. *Quartz.*
Cat's tail grass. *Phleum.*
Cauliflower. *Brassica.*
Cavy. *Cavia.*
Cayenne pepper. *Capsicum.*
Cayman. *Crocodilidæ.*
Cebadilla, the same as cevadilla
Cedar. *Abies.*
Cedar bird. *Ampelidæ.*
Celandine. *Chelidonium.*
Celery.—An edible vegetable belonging to the genus *Apium*, and order *Umbelliferæ.*
Centaurine.—The active principle of the little centaury. *Erythræa.*
Centaury. *Centaurea.*
Centipedes. *Chilopoda.*
Cerasine.—A principle found in the gum which exudes from the cherry tree.
Cere.—The naked skin, which, in some birds, covers the base of the bill.
Cereal grains.—Corn plants, as wheat, oats, barley, rice, rye, &c.
Cereus. *Cactaceæ.*
Cetrarine.—The bitter principle of Irish moss. *Thallogenæ.*
Cevadilla. *Veratrum.*
Ceylon indigo. *Tephrosia.*
Chaffinch. *Fringillinæ.*
Chalk.—Calcareous spar.
Chambered limpets. *Calyptræidæ.*
Chameleon. *Chameleonidæ.*
Chamois. *Antilopeæ.*
Chamomile. *Corymbiferæ*
Chandelier tree. *Pandanaceæ.*
Chank shell. *Turbinella.*
Char. *Salmonidæ.*
Charcoal bird. *Copsychus.*
Chat. *Saxicola.*
Chattering fly-catcher. *Icteria.*
Chatterers. *Ampelidæ.*
Cheetah. *Felinæ.*
Chelæ.—The bifid claws of the crustacea, scorpions, &c.
Chelicera.—The prehensile claws of the scorpion, which are the homologues of the antennæ of other insects.
Cherry. *Amygdaleæ.*
Cherry laurel. *Amygdaleæ.*
Chestnut. *Castanea.*
Chian turpentine. *Anacardiaceæ* and *Pistacia.*
Chick pea. *Cicer.*
Chickweed. *Stellaria.*
Chicory. *Cichorium.*
Chiff chaff. *Sylvinæ.*
Chigoe. *Aphaniptera.*
Chillies. *Capsicum.*
Chimpanzee. *Simiidæ.*
China root. *Smilax.*
Chinese grass cloth. *Boehmeria.*
Chive. *Allium.*
Chocolate. *Theobroma.*
Chough. *Corvidæ.*
Christmas rose. *Helleborus.*

Christ's thorn. *Paliurus* and *Ziziphus.*
Chub. *Leuciscus.*
Church-yard beetle. *Blapsidæ.*
Ciliograde.—Swimming or moving by the action of cilia.
Cinnamon. *Cinnamomum.*
Cinque-foil. *Potentilla.*
Cirrigrade.—Moving by the action of cirri.
Citron. *Aurantiaceæ.*
Civets. *Viverridæ.*
Clary. *Salvia.*
Clearing nut. *Strychnos.*
Climbing perch. *Anabasidæ.*
Clothes' moth. *Tineidæ.*
Cloud berry. *Rubus.*
Clove pink. *Caryophyllaceæ.*
Clover. *Trifolium.*
Clove tree. *Caryophyllus.*
Club moss. *Acrogenæ.*
Coal-fish. *Gadidæ.*
Coati-mondi. *Ursidæ.*
Cobra de capello. *Naja.*
Coca. *Erythroxylaceæ.*
Cochin-China monkey. *Presbytina.*
Cochineal. *Coccidæ.*
Cockatoo. *Cacatuinæ.*
Cockchafer. *Melolonthidæ.*
Cockle. *Cardiidæ.*
Cock of the rock. *Rupicola.*
Cock-paidle. *Cyclopteridæ.*
Cockroach. *Blattidæ.*
Cock's-comb. *Amaranthaceæ.*
Cock's foot grass. *Dactylis.*
Coco. *Araceæ.*
Cocoa nut palm. *Cocos.*
Cocumiglia. *Prunus.*
Cod-fish. *Gadidæ.*
Coffee. *Coffea.*
Coir. *Cocos.*
Colies. *Colius* and *Musophagidæ.*
Colins. *Perdix.*
Colocynth. *Citrullus.*
Colomba root. *Cocculus.*
Coloquintida. *Citrullus.*
Colt's foot. *Tussilago.*
Colugo. *Galeopithecus.*
Colza. *Brassica.*
Compound eyes. — Those eyes of insects which consist of an aggregate of hexagonal lenses.
Compound flowers. *Compositæ.*
Conch shell. *Triton.*
Condor. *Vulturidæ.*
Cones. *Conidæ.*
Conger eel. *Muræenidæ.*
Conia.—The alkaloid principle of the hemlock. *Conium.*
Conies. *Hyrax.*
Contrayerva. *Dorstenia.*
Convolvulus. *Calystegia.*
Coot. *Rallidæ.*
Copalchi bark. *Croton.*
Copaiva balsam. *Copaifera.*
Coquilla nut.—The fruit of a palm, *Attalea funifera;* the hard pericarp of which is used for making umbrella handles, buttons, &c.
Corals. *Anthozoa.*
Coral snake. *Elaps.*
Coral trees. *Erythrina.*
Cord-leaf plants. *Restiaceæ.*
Coriaceous.—Having the consistence of leath...
Coriander. *Coriandrum.*
Cork wood. *Anonaceæ.*
Cork tree. *Quercus.*
Cormorant. *Phalocrocorax.*
Corncrake. *Rallidæ.*
Cornea.—The transparent membrane in the fore part of the eye, through which the rays of light pass.
Cornel. *Cornaceæ.*
Corn-flag. *Gladiolus.*
Cornish chough. *Corvidæ.*
Corn weevil. *Calandra.*
Corwich. *Maia.*
Cotton grass. *Cyperaceæ.*
Cotton tree. *Gossypium.*
Coursers. *Charadriidæ.*
Cowage. *Dolichos.*
Cowbane. *Cicuta.*
Cowberry. *Vaccinium.*
Cow parsnip. *Heracleum.*
Cow-pen bird. *Molothrus.*
Cow plant of Ceylon. *Asclepiadaceæ.*
Cowries. *Cypræidæ.*
Cowslip. *Primulaceæ.*
Cow tree. *Apocynaceæ* and *Artocarpaceæ.*
Cow-wheat. *Melampyrum.*
Coypu. *Myopotamus.*
Crab (shore or harbour). *Carcinus.*
Crab (edible). *Cancer.*
Cranberry. *Oxycoccus.*
Crane. *Ardeidæ.*
Crane-flies. *Tipulidæ.*
Crane's bill. *Geraniaceæ.*
Crape paper. *Broussonetia.*
Cray-fish. *Macroura.*
Creepers. *Certhiidæ.*
Crepuscular.—Pertaining to the twilight. Certain birds and insects are called crepuscular, because they are seen on the wing late in the evening and before sunrise.
Cress. *Lepidium.*
Crickets. *Achetidæ.*
Crimson-throated finch. *Pyrrhulinæ.*
Crocodile. *Crocodilidæ.*
Crossbill. *Loxia.*
Crowberry. *Empetraceæ.*
Crow foot. *Ranunculus.*
Crows. *Corvidæ.*
Cryolite. *Fluoride of Calcium.*
Cubebs pepper. *Piperaceæ.*
Cuckoo flower. *Cardamine.*
Cuckoo-pint. *Araceæ.*
Cuckoos. *Cuculidæ.*
Cuckoo spit. *Cercopidæ.*
Cucumber. *Cucumis.*

Cudbear.—A dye procured from a species of lichen. *Thallogenæ.*
Cumin. *Cuminum.*
Curassows. *Cracidæ.*
Curlew. *Scolopacidæ.*
Currant. *Ribes.*
Currant of Australia. *Epacridaceæ.*
Custard apple family. *Anonaceæ.*
Cutch.—The same as catechu.
Cuticle.—A thin pellucid membrane covering the true skin.
Cuttle-fish. *Sepia.*
Cyclobranchiata.—Those molluscous animals which have the gills or branchiæ disposed in a circle.
Cypress. *Cupressineæ.*
Cyst.—A bag or tunic which includes morbid matter in animal bodies. Also a bag in which some animals usually live. These are said to be encysted.

Dab. *Platessa.*
Dace. *Leuciscus.*
Daddy-long-legs. *Tipulidæ*
Daffodil. *Amaryllidaceæ*
Daisy. *Bellis.*
Daman. *Hyrax.*
Damar. *Canarium.*
Dandelion. *Leontodon*
Darnel. *Lolium.*
Darter. *Plotus.*
Date palm. *Phœnix.*
Date plum. *Diospyros.*
Date shell. *Pholadidæ.*
Day lilies. *Hemerocallis.*
Deadly nightshade. *Atropa*
Dead nettle. *Lamium.*
Dead Sea fruits. *Cynipidæ.*
Death adder. *Viperidæ.*
Death's-head moth. *Acherontia.*
Death-watch. *Anobium.*
Deciduous cypress. *Taxodium.*
Deciduous trees.—Trees which lose their leaves every season. Leaves, after performing their functions for a certain time, wither and die. In doing so, they frequently change colour; and hence arise the beautiful and varied tints of the autumnal foliage. Most of the trees of this country are deciduous, the duration of the leaves not extending over more than a few months.
Deer. *Cervina.*
Delundung. *Prionodon.*
Demoiselle. *Ardeidæ.*
Desman. *Sorex.*
Devadara. *Abies.*
Devil in a bush. *Nigella.*
Devils' bit. *Scabiosa.*
Dewberry. *Rubus.*
Dhak tree. *Butea.*
Diabase.—A rock; same as diorite.
Diallage.—A variable mineral, composed of silica, united with magnesia and other bases. See *Euphotide.*
Diamond. *Carbon.*
Diamond beetle. *Curculionidæ.*
Diamond bird. *Pardalotus.*
Dichotomous.—Dividing regularly in pairs.
Dill. *Anethum.*
Dingo. *Canidæ.*
Dipper. *Hydrobata.*
Disintegrated.—Separated into integrant parts without chemical action.
Distichous (δις, twice; στιχος, order).—In insects, the antennæ, when the joints terminate in a fork, are said to be distichous. In botany, when the leaves are arranged in two rows they are called distichous.
Dittany. *Dictamnus.*
Divers. *Colymbidæ.*
Divi-divi. *Cæsalpineæ.*
Docks. *Rumex.*
Dodder. *Convolvulaceæ.*
Dodo. *Didus.*
Doe.—The female of the fallow deer.
Dog-fish. *Squalidæ.*
Dog-leaves. *Apocynaceæ.*
Dogs. *Canina.*
Dog's tail grass. *Cynosurus.*
Dog-wood. *Cornaceæ* and *Piscidia.*
Dolphins. *Delphinidæ.*
Doom palm of Egypt—is a species of hyphæne. *H. thebaica.*
Dor-beetle.—Same as shard-borne beetle. *Geotrupes.*
Dormant (sleeping).—In a state of rest or inaction.
Dormouse. *Myoxus.*
Dorsal.—Pertaining to the back—as the dorsal fin of a fish.
Dory. *Zeidæ.*
Double cocoa nut. *Lodoicea.*
Double monsters. *Autositarii.*
Douc.—A name given to the various species of Semnopithecus.
Doves. *Columbidæ.*
Dragon. *Draco.*
Dragonet. *Callionymus.*
Dragon-flies. *Libellulidæ.*
Dragon's blood. *Calamus, Dracæna,* and *Pterocarpus.*
Dragon tree. *Dracæna.*
Drake.—The male of the duck.
Dromedary. *Camelus.*
Drongo. *Edolius.*
Drums. *Pogonias.*
Drupe.—A succulent fruit, covered by a pericarp, such as the cherry, peach, plum, mango, walnut, &c., &c.
Dry rot.—A disease which attacks dry wood, and is caused by a minute fungus. *Thallogenæ.*
Duck. *Anatinæ.*
Duck-billed platypus. *Ornithorhynchus.*
Duck-weed. *Lemnæ.*
Dugong. *Manatidæ.*
Dulse.—A species of sea-weed. *Thallogenæ.*

Dumb cane. *Araceæ.*
Dung-feeding beetles. *Scarabæidæ.*
Durian. *Durio.*
Durmast.—The name given to Quercus sessiliflora.
Dutch rusk. *Acrogenæ.*
Dwale. *Atropa.*
Dyer's weed. *Genista.*
Dziggetai. *Equidæ.*

Eagle. *Aquilinæ.*
Eagle-hawk. *Aquilinæ.*
Eagle wood. *Aquilariaceæ.*
Ear shell. *Haliotis.*
Earth-nut. *Arachis.*
Earth worm. *Annelida.*
Earwigs. *Forficulidæ.*
Ebony. *Diospyros.*
Edentate.—Destitute of teeth.
Eels. *Muræenidæ.*
Egg plant. *Solanum.*
Eglantine. *Caprifoliaceæ*
Egret. *Ardeidæ.*
Egyptian goose. *Chenalopex.*
Eider duck. *Anatinæ.*
Eland. *Strepsiceræ.*
Elder. *Caprifoliaceæ.*
Elecampane. *Inula.*
Electric eel. *Gymnotus.*
Electric fish. *Malapterurus.*
Elemi (a gum). *Amyridaceæ.*
Elephant. *Elephantina.*
Elephant-beetle. *Dynastidæ.*
Elephant's foot. *Testudinaria.*
Elephant-shrew. *Macroscelides.*
Elk. *Cervina.*
Elms. *Ulmaceæ.*
Embryo.—The first rudiments of an animal in the womb.
Emerald. *Beryl.*
Emery. *Adamantine Spar* and *Corundum.*
Emetine. — Active principle of ipecacuanha. *Cephaelis.*
Emu. *Struthionidæ.*
Emulsine.—A kind of vegetable albumen existing in sweet almonds.
Encephalous.—Having a distinct head.
Endive. *Cichorium.*
Entomolite. — A term sometimes applied to a fossil insect.
Epidermis.—The outer covering or scarf skin. The membranous covering, or fibrous horny coating of some shells.
Epiphragm.—The membranaceous or calcareous substance by which some species of molluscs, as the helix, &c., close the aperture of their shells, when the animals retire within to hybernate.
Epizoa (ἐπι, upon; ζωον, animal).—Those animals which live parasitic *upon* other animals, in contradistinction to those which live *within* the bodies of animals, or the *Entozoa.*
Eocene (ηως, the dawn; καινος, recent).—The lowest great division of the tertiary strata, in which the dawn of recent life appears.
Ermine. *Mustelidæ.*
Ethiopian pepper. *Anonaceæ.*
Evening primrose. *Onagraceæ.*
Evergreen oak. *Quercus.*
Everlastings. *Gnaphalium* and *Helichrysum.*
Exotic.—Produced in a foreign country.
Extinct.—Having ceased to exist, and when discovered, only found in a fossil state.
Exuviæ. — Cast skins, shells, or coverings of animals which are shed or cast off. The remains of animals which at some period, long antecedent, were deposited in the earth.
Eyebright. *Euphrasia.*

Falcons. *Falconinæ.*
False or bastard acacia. *Robinia.*
Fairy rings.—Appearances produced by small fungi. *Thallogenæ.*
Fan palm. *Borassus.*
Fan-tail. *Rhipidura.*
Father John. *Ardeidæ.*
Father-lasher. *Cottidæ.*
Father sicklebill. *Ardeidæ.*
Feather grass. *Stipa.*
Feather star. *Comatula.*
Fennel. *Anethum.*
Fenugreek. *Trigonella.*
Fern owl. *Caprimulgidæ.*
Ferns. *Acrogenæ.*
Ferret. *Mustelidæ.*
Fescue grass. *Festuca.*
Fever bush. *Laurus.*
Feverfew. *Pyrethrum.*
"Fi-fi" fish. *Synanceia.*
Fig. *Ficus.*
Fig-wort. *Scrophulariaceæ.*
Filbert. *Corylaceæ.*
File-fish. *Balistidæ.*
Finches. *Fringillinæ.*
Fiorin grass. *Agrostis.*
Fire-clay. — Clay which bears a great heat without cracking or melting; often found under beds of coal.
Fire-flies. *Elateridæ.*
Firestone. — Stone which bears moderate heat without injury—usually sandy.
Firs. *Abies.*
Fish-dolphins. *Coryphænidæ.*
Fishes. *Pisces.*
Flagstone.—Laminated and fissile stone.
Flamingo. *Phœnicopterus.*
Flax. *Linaceæ.*
Flax (New Zealand). *Phormium.*
Flax (pita). *Agave.*
Flea. *Aphaniptera.*
Flies. *Muscidæ.*
Flounder. *Platessa.*
Flowering ash. *Ornus.*
Flowering bush. *Butomus.*

Flowering fern. *Osmunda.*
Fluke. *Distoma.*
Fly-catchers. *Muscicapidæ.*
Flying-fish. *Exocœtus.*
Flying gurnard. *Dactylopterus.*
Flying horse. *Syngnathidæ.*
Flying lemur. *Galeopithecus.*
Flying phalanger. *Petaurus.*
Flying squids. *Ommastrephes.*
Flying squirrel. *Pteromys.*
Fœtus.—The young of viviparous animals in the womb, and of oviparous animals in the egg, after it is perfectly formed; before which time it is called an embryo.
Fool's parsley. *Æthusa.*
Forbidden fruit. *Aurantiaceæ.*
Forget-me-not. *Myosotis.*
Fork-beard. *Phycis.*
Fossil.—Literally something which is dug out; but as a technical expression, used to mean organic remains of ancient life.
Fountain shell. *Strombidæ.*
Fox. *Canina.*
Foxglove. *Digitalis.*
Fox-tail grass. *Alopecurus.*
Francolins. *Perdix.*
Frankincense. *Amyridaceæ.*
Freestone.—Stone which admits of being freely cut and shaped; not marked by particular lamination.
French berries. *Rhamnaceæ.*
French honeysuckle. *Hedysarum.*
Friars' balsam. *Styracaceæ.*
Frigate bird. *Tachypetes.*
Frill lizard. *Chlamydosaurus.*
Frog. *Batrachia.*
Frog-bit. *Hydrocharidaceæ.*
Frog-fish. *Batrachus.*
Frog's cheese. *Bovista.*
Fullers' teazel. *Dipsacaceæ.*
Fumitory. *Fumariaceæ.*
Furze. *Ulex.*
Fustic. *Maclura.*

Gad-fly. *Oestridæ.*
Galangale. *Galanga.*
Gale. *Myricæ.*
Gall-flies. *Cynipidæ.*
Gallinazo. *Cathartes.*
Gall nuts. *Quercus.*
Gambets. *Scolopacidæ.*
Gambir.—A kind of catechu. *Nauclea.*
Gamboge. *Clusiaceæ.*
Gannet. *Sula.*
Garden cress. *Lepidium.*
Garden rocket. *Eruca.*
Gar-fish. *Belone.*
Garlic. *Allium.*
Garlic pear. *Crataevus.*
Garou bush. *Daphneæ.*
Garrulous honey-eater. *Myzantha.*
Gape. *Caprimulgidæ.*
Gavials. *Crocodilidæ.*
Gayal. *Bovidæ.*
Gazelle. *Antilopeæ.*
Genet. *Viverridæ.*
Gentian root. *Gentianeæ.*
Geology (γη, the earth; λογος, discourse or doctrine).—The science which treats of the formation, structure, &c., of the earth.
Gerbil. *Gerbillus.*
Gerkin. *Cucumis.*
Ghost moth. *Hepialidæ.*
Giant clam shell. *Tridacnidæ.*
Gibbon. *Hylobates.*
Gilliflowers. *Mathiola.*
Gills. *Branchiæ.*
Ginger. *Zingiberaceæ.*
Ginko. *Salisburia.*
Ginseng. *Araliaceæ.*
Giraffe. *Giraffinæ.*
Glacier.—From the German *Gletscher.* The peculiar ice which moves downwards from snowy mountains.
Glass shrimps. *Stomapoda.*
Glass-snake. *Ophisaurus.*
Glass-wort. *Salicornia.*
Glassy sailor. *Carinaria.*
Globe animalcule. *Volvocineæ.*
Glow-worm. *Lampyridæ.*
Glutinous hag. *Myxine.*
Glutton. *Gulo.*
Gnats. *Culicidæ.*
Gnu. *Antilopeæ.*
Goat. *Capreæ.*
Goat moth. *Cossus.*
Goat's beard. *Tragopogon.*
Goat-sucker. *Caprimulgidæ.*
Goby. *Cyprinidæ.*
Godwit. *Scolopacidæ.*
Golden-crested wren. *Regulus.*
Golden rod. *Solidago.*
Goldfinch. *Fringillinæ.*
Gold fish. *Cyprinidæ.*
Gold of pleasure. *Camelina.*
Goliath beetle. *Cetoniidæ.*
Goose. *Anserinæ.*
Gooseberry. *Ribes.*
Goose-foot. *Chenopodiaceæ* and *Potentilla.*
Goose grass. *Galium.*
Gorilla. *Simiidæ.*
Gossamer.—A species of small spider which is very common in autumn floating in the air, and which produces the fine silky threads known by the name of gossamer webs.
Gourd. *Cucurbita.*
Graining. *Leuciscus.*
Grains of Paradise. *Zingiberaceæ.*
Grakles. *Sturnidæ.*
Gram. *Phaseolus.*
Grampus. *Delphinidæ.*
Grape-sugar.—Sugar made from ripe grapes.
Vitaceæ.
Grass cloth. *Boehmeria.*
Grasses. *Gramineæ.*

Grasshoppers. *Gryllidæ.*
Grass of Parnassus. *Droseraceæ.*
Grass parrakeet. *Euphema.*
Grass tree. *Xanthorrhœa.*
Grayling. *Salmonidæ.*
Grebes. *Colymbidæ.*
Green colouring matter of plants. *Chlorophylle.*
Green-heart tree. *Lauraceæ.*
Green linnet. *Fringillinæ.*
Gregarious.—Animals are so called, which have the habit of assembling, or living in flocks, or herds.
Grenadilla. *Passiflora.*
Griffin. *Gypaëtos.*
Grison. *Gulo.*
Grosbeak. *Coccothraustinæ.*
Ground dove. *Cinclosoma, Gourinæ,* and *Turdidæ.*
Ground ivy. *Nepeta.*
Ground nut.—Same as earth nut.
Groundsel. *Senecio.*
Ground thrush. *Turdidæ.*
Grouse. *Lagopus.*
Grunts. *Pogonias.*
Guacharo bird and oil. *Caprimulgidæ.*
Guaco plant. *Mikania.*
Guaiacum. *Zygophyllaceæ.*
Guan. *Cracidæ.*
Guanaco. *Lama.*
Guarana bread. *Sapindaceæ.*
Gudgeon. *Cyprinidæ.*
Guelder rose. *Viburnum.*
Guernsey lily. *Amaryllidaceæ.*
Guillemot. *Alcidæ.*
Guinea fowl. *Numida.*
Guinea hen-weed. *Petiveria.*
Guinea pig. *Cavia.*
Guinea worm. *Filaria.*
Gulls. *Laridæ.*
Gulf weed. *Thallogenæ.*
Gum anime. *Vateria.*
Gum Arabic. *Acacia.*
Gum dragon. *Pterocarpus.*
Gum elemi. *Amyridaceæ.*
Gum-lac. *Coccidæ.*
Gum mastic. *Pistacia.*
Gum tragacanth. *Astragalus.*
Gum tree. *Eucalyptus.*
Gunny. *Corchorus.*
Gurnards. *Triglidæ.*
Gutta percha. *Isonandra.*
Gwyniad. *Salmonidæ.*

Haddock. *Gadidæ.*
Hag. *Gastrobranchus.*
Hair grass. *Aira.*
Hair streaks. *Thecla.*
Hair worm. *Gordius.*
Hake. *Gadidæ.*
Halophytes (αλη, salt; φυτον, plant).—Plants which grow in salt marshes.
Hammer oyster. *Aviculidæ.*
Hamster. *Cricetus.*
Hand tree. *Bombaceæ.*
Hare bell. *Campanulaceæ.*
Hares. *Leporidæ.*
Harfang.—A name sometimes given to the great snowy owl.
Haricots. *Phaseolus.*
Harriers. *Circinæ.*
Hart.—The stag, or male deer.
Hartshorn.—The horn of the hart, the raspings of which are used medicinally. It is composed of muriate of ammonia and a little animal oil.
Harvest-men spiders. *Phalangidæ.*
Haschish. *Cannabinaceæ.*
Haustellum.—The instrument or organ in the mouth of insects, by means of which they suck or pump up fluids.
Hawfinch. *Coccothraustinæ.*
Hawk-moths. *Sphingidæ.*
Hawk-owls. *Strigidæ.*
Hawks. *Accipitrinæ.*
Hawthorn. *Cratægus.*
Hawthorn butterfly. *Pieridæ.*
Hazel tree. *Corylaceæ.*
Heart'sease. *Violaceæ.*
Heath. *Ericaceæ.*
Heather. *Ericaceæ.*
Heavy earth. *Barytes.*
Hedgehog. *Erinaceus.*
Hedge hyssop. *Gratiola.*
Heliotrope. *Heliotropium.*
Hellebore. *Helleborus.*
Hellebore, white. *Veratrum.*
Helmet shell. *Cassis.*
Helminthology.—The study of that class of worms which live parasitic within the various cavities of the bodies of animals. See *Entozoa.*
Hemione. *Equidæ.*
Hemlock. *Conium.*
Hemp. *Cannabinaceæ.*
Hemp agrimony. *Eupatorium.*
Henbane. *Hyoscyamus.*
Henna. *Lawsonia.*
Hepatica. *Anemone.*
Hercules beetle. *Dynastidæ.*
Hermaphrodite.—An animal in which the male and female characteristics are combined.
Hermit crab. *Crustacea* and *Paguridæ.*
Heron. *Ardeidæ.*
Heron-bills. *Erodium.*
Herpetology.—The study of that class of animals called reptiles.
Herrings. *Clupeidæ.*
Heterogeneous.—Dissimilar, or different in kind or nature.
Hickory. *Carya.*
Hind.—The female of the red deer or stag.
Hog-fish. *Scorpœna.*
Hog-plums. *Anacardiaceæ.*
Hog's fennel. *Peucedanum.*
Holibut, or Halibut. *Hippoglossus.*

Hollyhocks. *Althæa.*
Holly tree. *Aquifoliaceæ.*
Homogeneous.—Of the same kind or nature.
Honey buzzard. *Milvina.*
Honey-guides. *Cuculidæ.*
Honey locust-tree. *Gleditschia.*
Honeystone. *Mellite.*
Honey-suckers. *Meliphagidæ* and *Nectarinidæ.*
Honeysuckle. *Caprifoliaceæ.*
Hoonuman. *Semnopithecus* and *Presbytina.*
Hoopoe. *Upupidæ.*
Hootia.—A synonym of musk cavy.
Hop. *Cannabinaceæ.*
Horehound (white). *Marrubium.*
Hornbeam. *Carpinus.*
Hornbill. *Buceros.*
Hornbill cuckoo. *Cuculidæ*, and *Crotophaga.*
Horned viper. *Cerastes* and *Viperidæ.*
Hornet. *Vespidæ.*
Hornstone.—An uncrystallized, infusible, flinty mineral, the same as chert.
Horse. *Equidæ.*
Horse cassia. *Cathartocarpus.*
Horse chestnut. *Hippocastaneæ.*
Horse mackarel. *Caranx.*
Horseman crab. *Crustacea.*
Horse radish. *Cochlearia.*
Horse radish tree. *Moringa.*
Horse-shoe bats. *Rhinolophus.*
Horse-shoe oyster. *Hippopus.*
Horse tails. *Acrogenæ.*
Hottentot's fig. *Mesembryanthemum.*
House leek. *Crassulaceæ.*
Howlef. *Mycetes.*
Howlets. *Strigidæ.*
Huanuco bark. *Cinchona.*
Human species (varieties of). *Bimana.*
Humble-bee. *Apidæ.*
Humble-bee fly. *Bombyliidæ.*
Humming birds. *Trochilidæ.*
Hyacinth, a plant. *Hyacinthus.*
Hyacinth, a mineral. *Zircon.*
Hyæna. *Canidæ.*
Hya-hya tree. *Apocynaceæ.*
Hydrophytes (ὕδωρ, water; φυτον, plant.—Plants which grow under water.
Hyssop. *Hyssopus.*
Hyssop of Scripture. *Capparidaceæ.*

Ibex. *Capridæ.*
Ibis. *Ardeidæ.*
Iceberg.—Portions of gl[illegible] floating on the sea or large lakes.
Iceland moss. *Thallogenæ.*
Ice plant. *Mesembryanthemum.*
Ichneumon. *Herpestes.*
Imago.—The last and adult state of insect life, when they appear in their proper shapes and colours, and undergo no more transformations.
Immature.—That has not acquired its perfect form or full colour.
Impeyan pheasant. *Lophophorus.*
Incisors.—The front teeth—the teeth used for cutting or separating the food; an important generic character in zoological science.
Incubation.—The act of sitting on eggs for the purpose of hatching young.
Indian cress. *Tropæolum.*
Indian fig. *Cactaceæ.*
Indian shot. *Canna.*
Indian tobacco. *Lobelia.*
India rubber. *Caoutchouc.*
India rubber tree. *Siphonia.*
Indigenous.—A native of a country.
Indigo. *Indigofera.*
Indri. *Lemuridæ.*
Intestinal worms. *Entozoa.*
Ipecacuanha. *Cephaelis.*
Irish moss. *Thallogenæ.*
Iron. *Ferrum.*
Ironstone.—Carbonate of iron, usually combined with argillaceous matter, in a nodular form.
Ironwood. *Metrosideros* and *Sideroxylon.*
Isinglass. *Sturionidæ.*
Ivory palm.—Same as vegetable ivory.
Ivory shell. *Eburna.*
Ivy. *Araliaceæ.*

Jacana. *Parra.*
Jackal. *Canina.*
Jackdaw. *Corvidæ.*
Jack tree. *Artocarpaceæ.*
Jacob's ladder. *Polemoniaceæ.*
Jade. *Nephrite.*
Jagery.—A kind of sugar made from the cocoa nut.
Jaguar. *Felinæ.*
Jalap. *Convolvulaceæ.*
Jamaica blackbird. *Crotophaga.*
Jamaica pepper. *Eugenia.*
Japan lacquer. *Anacardiaceæ.*
Jargon. *Zircon.*
Jasmine. *Jasminaceæ.*
Java sparrow. *Fringillinæ.*
Jays. *Corvidæ.*
Jerboa. *Dipus.*
Jerfalcon. *Falconinæ.*
Jerusalem artichoke. *Helianthus.*
Jessamine.—Same as Jasmine.
Jesuit's bark. *Cinchona.*
Jesuit's drops. *Styracaceæ.*
Jet. *Lignite.*
Jew bush. *Pedilanthus.*
Jew's mallow. *Corchorus.*
Job's tears. *Coix.*
John Crow vulture. *Cathartes.*
John Dory. *Zeidæ.*
Jointed charlock. *Raphanus.*
Joint firs. *Gnetaceæ.*
Judas tree. *Cereis.*
Jujube. *Ziziphus.*
Jumping hare. *Dipus.*
Jungle cat. *Felinæ.*
Jungle fowl. *Megapodius.*

Juniper. *Juniperus.*
Juvia tree. *Bertholletia.*

KALUMBA.—Same as Calumba.
Kangaroo. *Macropidæ.*
Kangaroo-rat. *Macropidæ.*
Kava. *Macropiper.*
Kawrie pine. *Dammara.*
Kentucky coffee tree. *Gymnocladus.*
Kermes. *Coccidæ.*
Kestrel. *Tinnunculus.*
Key fig. *Diospyros.*
Key-hole limpets. *Fissurellidæ.*
Kidney bean. *Phaseolus.*
King bird. *Muscicapidæ.*
King crab. *Xiphosura.*
King-fisher. *Alcedinidæ.*
King of the herrings. *Regalecus.*
Kinkajou, called also Potto.—A species of Cercoleptes, belonging to the bear family. It is arboreal in its habits, and a native of South America.
Kino. *Pterocarpus.*
Kites. *Milvinæ.*
Klipdas. *Hyrax.*
Knot-grass. *Polygonaceæ.*
Koala. *Macropidæ.*
Koochla.—A synonym of nux vomica.
Koodoo. *Strepsicereæ.*

LABURNUM. *Cytisus.*
Lac, or gum-lac. *Coccus.*
Lace-bark tree. *Daphne.*
Lacquer (Japan). *Anacardiaceæ.*
Lactescent.—Yielding a milky juice.
Lady birds. *Coccinellidæ.*
Lady cows. *Coccinellidæ.*
Lagoon, or Lagune.—A fen, moor, marsh, shallow pond or lake, as the lagunes of Venice.
Lamb's lettuce. *Valeriana.*
Lammergeyer. *Gypaetos.*
Lamprey. *Petromyzon.*
Lancelet. *Amphioxus.*
Lancet fishes. *Acanthuris.*
Lancewood. *Anonaceæ.*
Land crab. *Gecarcinus* and *Crustacea.*
Land snails. *Helicidæ.*
Langsat. *Lansium.*
Lan-hoa. *Oleaceæ.*
Lantern flies. *Fulgoridæ.*
Lapwing. *Charadriidæ.*
Larch. *Abies.*
Larks. *Alaudinæ.*
Larkspur. *Delphinium.*
Laser. *Laserpitium.*
Launce. *Ammodytes,*
Laurel. *Lauraceæ* and *Amygdaleæ.*
Laurel (Portugal). *Amygdaleæ.*
Laurustinus. *Viburnum.*
Lavender. *Lavandula.*
Laver. *Ulva*
Leaf cutters. *Phytotoma.*
Leaf green. *Chlorophylle.*
Leaf-nosed bats. *Phyllostoma.*
Leaf-rolling moths. *Tortricidæ.*
Leaping shrimp. *Crustacea.*
Leech. *Annelida.*
Leek. *Allium.*
Lemmings. *Murina.*
Lemon. *Aurantiaceæ.*
Lemon grass.—A species of Andropogon. *A. schœnanthus.*
Lentil shells. *Ervilia.*
Lentils. *Ervum.*
Leopard. *Felinæ.*
Leopard's bane. *Arnica.*
Lettuce. *Lactuca.*
Lianas or Lianes.—Twining plants; in warm climates often forming woody stems; but in temperate countries are generally herbaceous.
Lichenin or Lichen starch.—A nutritious matter found in Iceland moss.
Lichens. *Thallogenæ.*
Ligne aloes. *Aquilariaceæ.*
Lignum-vitæ. *Guaiacum.*
Lilac-tree. *Syringa.*
Lily. *Liliaceæ.*
Lily beetle. *Criocerida.*
Lily of the Valley. *Convallaria.*
Lime. *Aurantiaceæ.*
Lime grass. *Elymus.*
Limestone.—Calcareous spar.
Lime tree. *Tiliaceæ.*
Limpet. *Patella.*
Linden tree.—The same as lime tree.
Linen. *Linaceæ.*
Ling. *Gadidæ* and *Ericaceæ.*
Linnets. *Fringillidæ.*
Linseed. *Linaceæ.*
Lions. *Felinæ.*
Liquid ambar. *Balsamaceæ.*
Liquorice. *Glycyrhiza.*
Litchi. *Sapindaceæ.*
Lithocarp.—Petrified fruit.
Lithophytes.—Marine plants, whose skeleton is formed by secretion of calcareous matter instead of carbon.
Litmus. *Crozophora.*
Little Centaury. *Erythræa.*
Lizard. *Lacertinidæ.*
Lizard-tailed star-fishes. *Ophiuridæ.*
Lizard-tails.—The name given to the family of plants *Saurureæ.*
Loach. *Cobitis.*
Lobsters. *Homarus.*
Locusts. *Locustidæ.*
Locust tree. *Hymenæa.*
Logwood. *Hæmatoxylon.*
London pride. *Saxifragaceæ.*
Longan. *Sapindaceæ.*
Long-armed apes. *Hylobates.*
Long-tailed crustacea. *Macroura.*
Lontra. *Lutra.*

Loose-strife. *Lythrum.*
Loquat. *Pomaceæ.*
Lories. *Psittacidæ.*
Lotus of Egypt. *Nymphæa.*
Louse. *Anoplura.*
Louse-wort. *Pedicularis.*
Love lies bleeding. *Amaranthaceæ.*
Lucern. *Medicago.*
Luminous plants. *Rhizomorpha.*
Lump-sucker. *Cyclopteridæ.*
Lung-wort. *Pulmonaria.*
Lupulin.—Active principle of the hop. *Cannabinaceæ.*
Lynx. *Felinæ.*
Lyre-bird. *Menura.*

Macartney cock. *Phasianidæ.*
Macaws. *Psittacidæ.*
Mace. *Myristicaceæ.*
Mackarel. *Scomberidæ.*
Madder. *Rubiaceæ.*
Madhuca tree.—Same as Indian butter tree. *Bassia.*
Magot.—The same as the Barbary ape.
Magpie. *Corvidæ.*
Mahogany. *Cedrelaceæ.*
Maiden-hair fern. *Acrogenæ.*
Maiden plum. *Comocladia.*
Maigre. *Sciæna.*
Mailed-cheek fishes. *Sclerogènidæ.*
Maize. *Zea.*
Maize thieves. *Sturnidæ.*
Malachite.—Copper.
Mallow. *Malvaceæ.*
Malmag.—A synonym of *Tarsier.*
Mammæ.—The teats or breasts.
Mammee Apple. *Clusiaceæ.*
Mammoth. *Elephantidæ.*
Man. *Bimana* and *Homo.*
Manakins. *Piprinæ.*
Manatee. *Manatidæ.*
Manchineel. *Hippomane.*
Mandibles.—The upper and under parts of the bill in birds. In entomology, the upper and under pair of jaws.
Mandrake. *Atropa.*
Mandrill. *Cynocephalus.*
Mange.—The scab or itch in dogs, cattle, and other beasts.
Mango. *Anacardiaceæ.*
Mango-fish. *Polynemus.*
Mangold wurzel. *Beta.*
Mangosteen. *Garcinia.*
Mangrove tree. *Rhizophoraceæ.*
Manna. *Ornus.*
Manna ash. *Ornus.*
Manna croup. *Glyceria.*
Manna of Mount Sinai. *Tamarix.*
Mannite.—The peculiar principle of manna. *Ornus.*
Man-of-war bird. *Tachypetes.*
Mantle.—The external, soft, contractile skin of the mollusca, which covers the viscera and a great part of the body, like a cloak.
Mantis crabs. *Stomapoda.*
Maple. *Acer.*
Marabou. *Ardeidæ.*
Marble. *Marmor* and *Calcareous spar.*
Mare.—The female of the horse or other species belonging to the family *Equidæ.*
Mare's tail. *Haloragaceæ.*
Marigold. *Calendula.*
Marjoram. *Origanum.*
Marking nut tree. *Anacardiaceæ.*
Marl.—A term variously employed. Sometimes it means a fresh water clay, rich in shells; at other times it is used to designate a sort of soft chalk; but properly it signifies an argillaceous stratum with much calcareous matter in it.
Marmot. *Arctomys.*
Marmozet. *Jacchus.*
Marsh mallow. *Althæa.*
Marsh marigold. *Caltha.*
Marsh trefoil. *Menyanthes.*
Martens. *Mustelidæ.*
Martins. *Hirundinidæ.*
Marvel of Peru. *Mirabilis.*
Mastic. *Anacardiaceæ.*
Matamata. *Chelonia.*
Maté. *Aquifoliaceæ.*
Maxillæ.—The second or lower pair of jaws in insects, distinguished by bearing feelers.
Meadow grass. *Poa.*
Meadow rue. *Thalictrum.*
Meadow saffron. *Colchiceæ.*
Meadow sweet. *Spiræa.*
Meal worm. *Tenebrionidæ.*
Mealy bugs. *Coccidæ.*
Meat fly or flesh fly. *Muscidæ.*
Meconine.—A crystalline principle existing in opium. *Papaveraceæ.*
Medlar. *Mespilus.*
Medusa or gorgon heads. *Ophiuridæ.*
Melilot. *Melilotus.*
Melon. *Cucumis.*
Merganser. *Mergus.*
Mermaid.—A fabulous marine animal, said to resemble a woman in the upper parts of the body, and a fish in the lower part.
Metamorphosis (μετα, through; μορφη, form).—Change of form or shape; as the change of an insect from the chrysalis state into a winged animal.
Mezereon. *Daphne.*
Mias. *Simiidæ.*
Mice. *Murina.*
Midges. *Chironomus.*
Mignionette. *Reseda.*
Mildew. *Mucedines* and *Thallogenæ.*
Milk tree. *Apocynaceæ.*
Milk-wort. *Polygalaceæ.*
Millepore.—A genus of corals which have the surface perforated with little holes or pores, or even without any apparent perforation.

Miller's thumb. *Cottidæ.*
Millet. *Panicum.*
Mineral pitch. *Asphaltum.*
Mineral tallow. *Hatchettine.*
Mink. *Mustelidæ.*
Minnow. *Leuciscus.*
Mint. *Mentha.*
Mirité palm. *Mauritia.*
Mistletoe. *Viscum.*
Mites. *Acaridæ.*
Mocking bird. *Mimus.*
Moko. *Cavia.*
Mole. *Talpa.*
Mole-rat. *Bathyergus.*
Monkey bread. *Adansonia.*
Monkey pot. *Lecythideæ.*
Monkeys. *Cebidæ* and *Cercopithecina.*
Monk seal. *Phocidæ.*
Monk's hood. *Aconitum.*
Moon-seed family. *Menispermaceæ.*
Monster.—An animal produced with a shape or parts that are not natural.
Moonstone. *Selenite* and *Felspar.*
Moon-wort. *Botrychium.*
Morel. *Morchella.*
Morphine.—The active principle of opium. *Papaveraceæ.*
Morse. *Phocidæ.*
Mosquito. *Culicidæ.*
Mother Carey's chicken. *Procellarinæ.*
Mother-of-Pearl. *Aviculidæ.*
Moth-hunter.—A synonym of goat-sucker.
Moths. *Lepidoptera* and *Bombycidæ.*
Motmot. *Momotus.*
Moufflon. *Ovea.*
Mould. *Mucor.*
Moulds. *Aspergillus.*
Mountain ash. *Pomaceæ.*
Mountain flax. *Amianthus.*
Mouse. *Muridæ.*
Mouse-ear. *Myosotis.*
Moxa. *Artemisia.*
Mudar. *Asclepiadaceæ.*
Mud eel. *Sirenidæ* and *Lepidosiren.*
Mulberry. *Morus.*
Mullein. *Verbascum.*
Mullets. *Mugilidæ.*
Munjeet. *Rubiaceæ.*
Muntjac. *Cervidæ.*
Muscardine.—A disease which attacks the silk worm. *Bombycidæ* and *Thallogenæ.*
Mushroom coral. *Agaricia.*
Mushrooms. *Thallogenæ.*
Music shell. *Volutidæ.*
Musk beetle. *Cerambycidæ.*
Musk cavy. *Capromys.*
Musk deer. *Moschina.*
Musk duck. *Anatina.*
Musk ox. *Bovea.*
Muskwash. *Ondatra.*
Mussels. *Mytilidæ.*
Mustard plant. *Sinapis.*
Mustard tree. *Salvadora.*
Myrobalans. *Terminalia.*
Myrosine.—A peculiar principle contained in mustard seeds. *Sinapis.*
Myrounga.—A synonym of the elephant-seal.
Myrrh. *Amyridaceæ.*
Myrtle. *Myrtaceæ.*
Myrtle bird. *Sylvicolinæ.*

NACRE.—The pearly surface of the interior of a shell. The substance which produces pearls.
Nandou.—A name of the rhea, or American ostrich.
Narcissus. *Amaryllidaceæ.*
Narcotine.—A crystalline principle found in opium. *Papaveraceæ.*
Narwahl. *Delphinidæ.*
Nasturtium. *Tropæolum.*
Nectarine. *Amygdaleæ.*
Negro pepper. *Unona.*
Nereid. *Annelida.*
Neroli oil.—An oil procured from the flowers of the Seville or bitter orange.
Nettle. *Urticaceæ.*
Nettle tree. *Celtis.*
Neutria. *Myopotamus.*
New Zealand crow. *Glaucopis.*
New Zealand flax. *Phormium.*
Nicotine.—The active principle of tobacco. *Nicotiana.*
Night-blowing cereus. *Cactaceæ.*
Nightingale. *Luscinidæ.*
Night-jar. *Caprimulgidæ.*
Nil-ghau. *Strepsiceræ.*
Nipple-wort. *Lapsana.*
Noddy. *Laridæ.*
Nodule.—A mass of rock collected by attraction round some central point or nucleus.
Norfolk Island flying squirrel. *Macropidæ.*
Norfolk Island pine. *Araucaria.*
Normal.—According to rule; natural.
Norway haddock. *Sebastes*
Norway lobster. *Nephrops*
Nutcracker. *Corvidæ.*
Nuthatch. *Sitta.*
Nutmeg. *Myristicaceæ.*
Nut weevil. *Balaninus.*
Nux vomica. *Strychnos.*

OAK TREES. *Quercus.*
Oats. *Avena.*
Obsolete.—Partially indistinct; not well defined; not fully developed.
Ocelot. *Felinæ.*
Ochre.—Silica and alumina in very fine powder, coloured by oxide of iron.
Ocellus.—An eye-like spot, as is seen in the wings of certain lepidropterous insects. The simple eyes of insects. The eyes of larvæ, spiders, &c.
Oil beetles. *Cantharidæ.*
Oil of ben. *Moringa.*

Oleander. *Apocynaceæ.*
Oleaster. *Elæagnaceæ.*
Olibanum. *Amyridaceæ.*
Olive. *Oleaceæ.*
Onager. *Equidæ.*
Onion. *Allium.*
Opah. *Lampris.*
Opium. *Papaveraceæ.*
Opobalsam. *Amyridaceæ.*
Opossum. *Didelphidæ.*
Opossum shrimps. *Stomapoda.*
Orange. *Aurantiaceæ.*
Orange-tip butterfly. *Pieridæ.*
Orang-utang. *Simiidæ.*
Orbit.—The skin which surrounds the eye.
Orchil or Archil.—A valuable dye. *Thallogenæ.*
Organ coral. *Anthozoa.*
Organic remains.—Any recognizable part of plants or animals in a fossil state.
Orioles. *Turdidæ.*
Orris root. *Iridaceæ.*
Ortulan. *Emberizinæ.*
Orvet.—Another name for the blind worm. *Anguis.*
Oryctography.—That part of natural science which treats of fossils.
Oryx. *Antilopeæ.*
Osier. *Salix.*
Osprey. *Aquilinæ.*
Ostrich. *Struthionidæ.*
Otters. *Lutra.*
Otter shells. *Lutraria.*
Ouistiti. *Jacchus.*
Ounce. *Felinæ.*
Ourari poison. *Strychn*
Ovipositor.—The organ in insects (as in the *Ichneumonidæ*), for the transmission of the eggs, during exclusion, to their appropriate place.
Owl parrot. *Strigops.*
Owls. *Strigidæ.*
Ox. *Boveæ.*
Oxlip. *Primulaceæ.*
Ox-pecker.—Another name for the beef-eater. *Buphaga.*
Oyster. *Ostreidæ.*
Oyster-catcher. *Charadriidæ.*
Oyster plant. *Boraginaceæ.*

Paca. *Cœlogenys.*
Paddy. *Oryza.*
Pæony rose. *Pæonia.*
Painted crab. *Grapsus.*
Palma Christi. *Ricinus.*
Palm of the Bible. *Phœnix.*
Palm oil. *Elæis.*
Palpi.—The organs of touch developed from the maxillæ and labium of insects.
Panda. *Ailurus.*
Pangolin. *Manis.*
Pansy. *Violaceæ.*
Panther. *Felinæ.*
Papa de loma.—Peruvian name for a plant with tuberous roots, which are used as potatoes. *Witheringia.*
Papaw tree. *Carica.*
Paper mulberry. *Broussonetia.*
Paper nautilus. *Argonauta.*
Papyrus. *Cyperaceæ.*
Paraguay tea. *Psoralea.*
Pareira brava. *Cissampelos.*
Parigline.—A peculiar crystalline principle found in the roots of sarsaparilla. *Smilax.*
Parrakeets. *Psittacidæ.*
Parroquet seeds. *Carthamus.*
Parrots. *Psittacidæ.*
Parsley. *Petroselinum.*
Parsnip. *Pastinaca.*
Partridge-berry. *Gaultheria.*
Partridges. *Perdix.*
Pasque flower. *Anemone.*
Passion-flower. *Passiflora.*
Patience. *Rumex.*
Pauxi. *Cracidæ.*
Pea. *Pisum.*
Peach. *Amygdaleæ.*
Peach palm. *Gulielma.*
Peacocks. *Pavoninæ.*
Pea crab. *Crustacea.*
Pea crabs. *Pinnotheres.*
Pear encrinite. *Crinoideæ.*
Pearl mussel. *Unionidæ.*
Pearl oyster. *Aviculidæ.*
Pears. *Pomaceæ.*
Peastone. *Pisolite.*
Pecari. *Dicotyles.*
Pech-kole. *Lignite.*
Pelagian.—Formed in deep sea, as distinct from littoral and estuary.
Pelican. *Pelecanidæ.*
Pellitory of Spain. *Pyrethrum.*
Pellitory of the wall. *Parietaria.*
Pencil cedar. *Juniperus.*
Penguin. *Alcidæ.*
Pennsylvania tea. *Monarda.*
Penny royal. *Mentha.*
Penny-wort. *Hydrocotyle.*
Pepper. *Piperaceæ.*
Peppermint. *Mentha.*
Perch. *Percidæ.*
Peregrine falcon. *Falconinæ.*
Pereostracum.—The membrane analogous to scarf skin which covers shells.
Periwinkle. *Littorina* and *Apocynaceæ.*
Persymmon tree. *Diospyros.*
Peruvian bark. *Cinchona.*
Petrels. *Procellarinæ.*
Pewit. *Laridæ.*
Phalangers. *Macropidæ.*
Pheasant cuckoo. *Centropus.*
Pheasants. *Phasianidæ.*
Philip Island parrot. *Nestor.*
Phlox. *Polemoniaceæ.*
Physic nut. *Jatropha.*
Phytology.—The general study of plants.

Piassaba palm. *Leopoldinia.*
Picotees. *Caryophyllaceæ.*
Picrotoxin.—The poisonous principle of the Cocculus indicus berries. *Cocculus.*
Pigeons. *Columbidæ.*
Pig nut. *Bunium.*
Pigs. *Suidæ.*
Pig shell. *Cypræidæ.*
Pike-fish. *Esocidæ.*
Pilchard. *Clupeidæ.*
Pilot-fish. *Naucrates.*
Pimento. *Eugenia.*
Pimpernel. *Anagallis.*
Pine apple. *Bromeliaceæ.*
Pine trees. *Pinus.*
Piney tallow. *Vateria.*
Pink. *Caryophyllaceæ.*
Pink-root. *Spigelia.*
Pinnated grouse. *Tetraonidæ.*
Pintado. *Numida.*
Pipe-fish. *Syngnathidæ.*
Pipe-moths.—The name of the fishes belonging to the genus Fistularia.
Pipit or tit larks. *Anthus.*
Pippul tree. *Ficus.*
Piranha. *Serrasalmo.*
Pistachio nut. *Pistacia* and *Anacardiaceæ.*
Pita flax. *Agave.*
Pitch. *Pinus.*
Pitcher plant. *Nepenthes.*
Placenta.—The substance which connects the fœtus to the womb, and by which the circulation is carried on between the parent and the fœtus.
Plaice. *Platessa.*
Plane trees. *Platanus.*
Plantain. *Musaceæ.*
Plantains. *Plantaginaceæ.*
Plantain-eaters. *Musophagida*
Plantigrade.—When the whole or part of the sole of the foot is placed flat on the ground in walking, as is the case with certain carnivorous animals, as bears, &c.
Plant lice. *Aphidæ.*
Plovers. *Charadriidæ.*
Plum. *Amygdaleæ* and *Prunus.*
Poe-bird. *Prosthemadera.*
Poison ash. *Amyridaceæ.*
Poison nut. *Strychnos.*
Poke, or American grape. *Phytolaccaceæ.*
Polatouche. *Pteromys.*
Polecats. *Mustelidæ.*
Polyanthus. *Primulaceæ.*
Polygamous.—Not confined to one mate, but pairing promiscuously; as is the case with certain birds and animals.
Polypes. *Anthozoa.*
Pomegranate. *Punica.*
Pond snail. *Paludina* and *Lymnæa.*
Pond-weed. *Naiadaceæ.*
Poplar trees. *Populus.*
Poppy. *Papaveraceæ.*
Porcupine ant-eater. *Echidna.*
Porcupines. *Hystricid*
Porphyrio. *Rallidæ.*
Porpoise. *Delphinidæ.*
Portland sago. *Araceæ.*
Portugal laurel. *Amygdaleæ.*
Portuguese man-of-war. *Physalia*
Potato. *Solanum.*
Potato fly. *Cantharidæ.*
Potato disease. *Aphidæ.*
Potoroo. *Macropidæ.*
Pouched rat. *Saccomys.*
Poultry. *Gallinæ.*
Pounce. *Callitris.*
Prairie dog. *Arctomys.*
Prawn. *Palæmon.*
Prehensile.—Seizing; grasping; laying hold of. The tails of some monkeys, the tongues of some animals, &c., are prehensile.
Prickly ash. *Xanthoxylaceæ.*
Prickly pear. *Cactaceæ.*
Primroses. *Primulaceæ.*
Prince's feather. *Amaranthaceæ.*
Privet. *Ligustrum.*
Proboscis.—The name applied to the flexible prehensile organ formed by the prolongation of the nose, as is the case with the elephant, &c.; also to the organ in insects, as in butterflies, &c., by which they suck the juice of plants, or pierce the skin of animals, in order to suck their blood.
Proboscis monkey. *Presbytina.*
Processionary moths. *Cnethocampa.*
Prunes. *Amygdaleæ.*
Ptarmigan. *Lagopus.*
Puff adder. *Viperidæ.*
Puff-birds. *Tamatias.*
Puff-ball. *Bovista* and *Lycoperdon.*
Puffins. *Alcidæ.*
Puma. *Felina.*
Pumpkin. *Cucurbita.*
Purging nut.—Same as physic nut.
Purslane. *Portulacaceæ.*
Pythagorean bean. *Nelumbiaceæ.*
Python. *Boidæ.*

Quagga. *Equidæ.*
Quails. *Perdix.*
Quaking grass. *Brizu.*
Queen of the meadows. *Spiræa.*
Queen's pigeon. *Gourinæ.*
Quercitron. *Quercus.*
Quicks. *Agrostis.*
Quicksilver. *Mercur*
Quill-wort. *Isoetes.*
Quince. *Cydonia.*

Rabbits. *Leporid*
Races of men. *Hom*
Racoons. *Ursidæ.*
Radish. *Raphanus.*
Rails. *Rallidæ.*

Rain birds. *Cuculidæ.*
Rampion. *Campanulaceæ.*
Rape. *Brassica.*
Raspberry. *Rubus.*
Rat. *Murina.*
Ratel. *Ratelus.*
Rat-tailed larvæ. *Elophilus.*
Rattan. *Calamus.*
Rattlesnake. *Crotalina.*
Rattlesnake fern. *Botrychium.*
Raven. *Corvidæ.*
Rays. *Raiidæ.*
Razorbill. *Alcidæ.*
Razor-fish. *Xyrichthys.*
Razor shell. *Solenidæ.*
Redbreast. *Erythacus.*
Red cedar. *Juniperus.*
Red deer. *Cervidæ.*
Red eye. *Leuciscus.*
Red sea-weeds. *Florideæ.*
Red snow. *Protococcus.*
Red spiders. *Erythræus*
Redstart. *Sylvinæ.*
Red-winged starling. *Sturnidæ.*
Reed. *Arundo* and *Phragmites.*
Reindeer. *Cervina.*
Reindeer moss. *Thallogenæ.*
Rest harrow. *Ononis.*
Rhatany root. *Krameria.*
Rhizogens. *Rhizantheæ.*
Rhubarb. *Rheum.*
Ribbon-fish. *Tæniidæ.*
Rib-worts. *Plantaginaceæ.*
Rice. *Oryza.*
Rice bunting. *Dolichonyx.*
Rice paper. *Eschinomene.*
Rifle-bird. *Ptiloris.*
Ringed snake. *Natrix.*
River horse. *Hippopotamus.*
River mussels. *Unionidæ.*
River pig. *Suidæ.*
Roach. *Leucisus.*
Robin redbreast. *Erythacus.*
Rocambole. *Allium.*
Rock crystal. *Quartz.*
Rock kangaroo. *Petrogale.*
Rock rose. *Cistaceæ* and *Helianthemum.*
Rock snake. *Boidæ.*
Roebuck. *Cervina.*
Rollers. *Coracianæ.*
Rook. *Corvidæ.*
Rorqual. *Balænidæ.*
Rose apple. *Eugenia.*
Rose chafer. *Cetoniidæ.*
Rosemary. *Rosmarinus.*
Rose of Jericho. *Andstatica.*
Roses. *Rosa.*
Rosewood.—The timber of two or three species of the genus *Trioptolomea*, a leguminous plant. See *Leguminosæ.*
Rouge. *Carthamus.*
Roussettes. *Pteropus.*
Rove beetles. *Brachelytra.*
Ruby-tail flies. *Chrysididæ.*
Rue. *Ruta.*
Ruffed grouse. *Bonasa.*
Ruffs. *Scolopacidæ.*
Ruminant.—Chewing the cud.
Rush. *Juncaceæ.*
Rye. *Secale.*

Sabadilla.—A synonym of cevadilla.
Sable. *Mustelidæ.*
Sacred beetle. *Ateuchus.*
Sadajac. *Lagomys.*
Safflower. *Carthamus.*
Saffron. *Crocus.*
Sagapenum. *Ferula.*
Sage. *Salvia.*
Sago palm. *Sagus.*
Sago (Portland). *Arum.*
Sailor crab. *Grapsus.*
St. Cuthbert's beads. *Crinoideæ.*
Saintfoin. *Onobrychis.*
St. Ignatius's bean. *Strychnos.*
St. John's bread. *Ceratonia.*
St. John's-wort. *Hypericum.*
Sakis. *Pithecia.*
Salamander. *Batrachia.*
Salep. *Orchidaceæ.*
Salicine.—The bitter principle existing in the willows. *Salicineæ.*
Salmon. *Salmonidæ.*
Salsify. *Tragopogon.*
Samphire. *Crithmum.*
Sandal wood. *Pterocarpus* and *Santalaceæ.*
Sandarach.—Another name for pounce.
Sandbox tree. *Hura.*
Sand eel. *Ammodytes.*
Sandpipers. *Scolopacidæ.*
Sand wasps. *Sphecidæ.*
Sapajou. *Cebidæ.*
Sapan wood. *Cæsalpinieæ.*
Saponine.—The peculiar principle of the soap-wort. *Caryophyllaceæ.*
Sapphire. *Adamantine spar* and *Corundum.*
Sappodilla plum. *Sapotaceæ.*
Sapucaya nuts. *Lecythideæ.*
Sardine. *Atherina.*
Sarsaparilla. *Smilax.*
Sarsaparilla (German). *Carex.*
Sarza.—A synonym of sarsaparilla.
Sassafras. *Laurus.*
Satin wood. *Cedrelaceæ.*
Saurel. *Caranx.*
Saurian.—A name applied to the lizard tribe.
Savin. *Juniperus.*
Savoys. *Brassica.*
Sawarra nuts. *Pekea.*
Saw-fish. *Pristis.*
Saw-flies. *Tenthredinidæ.*
Saxifrages. *Saxifragaceæ.*
Scad. *Caranx.*
Scale-insects. *Coccidæ.*
Scales. *Squamæ.*

Scallop. *Pectenidæ.*
Scammony. *Convolvulaceæ.*
Scarlet runner. *Phaseolus.*
Scavenger. *Ardeidæ.*
Scorpion. *Scorpionidæ.*
Scorpion-lobsters. *Macroura.*
Scorzonera.—A Spanish pot-herb.
Scotch fir. *Pinus.*
Scotch pebble. *Agate.*
Scoter duck. *Anatinæ.*
Screw pine. *Pandanaceæ.*
Scurvy-grass. *Cochlearia.*
Scythian lamb.—A species of fern. *Acrogenæ*
Sea arrows. *Ommastrephes.*
Sea bream. *Pagellus.*
Sea buckthorn. *Elæagnaceæ.*
Sea centipede. *Annelida.*
Sea cucumber. *Psolus* and *Holothuriidæ.*
Sea date-shell. *Lithodomus.*
Sea devil. *Lophiidæ.*
Sea ducks. *Fuligulinæ.*
Sea eggs. *Echinidæ.*
Sea fleas. *Talitrus.*
Sea hedgehogs. *Echinida*
Sea holly. *Eryngium.*
Sea horse. *Syngnathidæ.*
Sea kale. *Crambe.*
Sea lavender. *Statice.*
Sea lemons. *Doris.*
Sea leopard. *Phocidæ.*
Seal. *Phocidæ.*
Sea mice. *Annelida.*
Sea nettles. *Acalephæ.*
Sea otter. *Enhydra.*
Sea pens. *Anthozoa.*
Sea perch. *Percidæ.*
Sea pike. *Centropomus.*
Sea pinks. *Plumbaginaceæ* and *Statice.*
Sea-side grape. *Cocolobus.*
Sea slugs. *Holothuriidæ.*
Sea snakes. *Hydridæ.*
Sea snipe. *Centriscus.*
Sea spider. *Octopodidæ* and *Pycnogonidæ.*
Sea unicorn. *Delphinidæ.*
Sea urchins. *Echinidæ.*
Sea-weeds. *Thallogenæ.*
Sea wolf. *Anarrhicas.*
Sea wood-lice. *Chitonidæ* and *Isopoda.*
Sebesten plum. *Cordiaceæ.*
Secretary bird. *Serpentarius.*
Sedge. *Cladium* and *Cyperaceæ.*
Senna. *Cassia.*
Sensitive plant. *Mimosa.*
Serval. *Felinæ.*
Service tree. *Pomaceæ.*
Serpents. *Ophidia.*
Seventeen-years' locust. *Cicadidæ*
Sexton beetles. *Necrophorus.*
Shad. *Clupeidæ.*
Shaddock. *Aurantiaceæ.*
Shagreen. *Squalidæ.*
Shallot. *Allium.*
Shamrock. *Oxalidaceæ.*
Shard-borne beetle. *Geotrupidæ.*
Sharks. *Squalidæ.*
Shearwaters. *Puffinus.*
Sheldrake.—Another name for shield-drake.
Sheep. *Oveæ.*
Sheep's-head fish. *Sargus.*
Sheep tick. *Melophagus.*
She oak. *Casuarinæ.*
Shielded bugs. *Scutelleridæ.*
Shield-drake. *Anatinæ.*
Ship timber beetle. *Lymexylon.*
Ship worm. *Teredo.*
Shrew mole.—Another name for the water mole.
Shrew mouse. *Sorex.*
Shrikes. *Laniidæ.*
Shrimps. *Crangon.*
Siamang. *Hylobates.*
Siamese twins. *Monomphalii.*
Side-saddle family. *Sarraceniaceæ.*
Siliceous.—Partaking of the nature or qualities of silex or flint.
Silk cotton tree. *Bombaceæ.*
Silkworm. *Bombycidæ.*
Siller tassels. *Briza.*
Silver fir. *Abies.*
Simarouba. *Quassia.*
Sinapin or sinapisin.—The active principle of mustard. *Sinapis.*
Single monsters. *Autositi.*
Sinus.—A groove, channel, or depression.
Siphon.—A cylindrical tube; the pipe by which the chambers of a shell communicate; a fleshy sucker.
Siskin. *Fringillinæ.*
Skate. *Raiidæ.*
Skimmer. *Laridæ.*
Skinks. *Scincidæ.*
Skip-jacks.—English name for the *Elateridæ.*
Skippers. *Hesperiidæ.*
Skua gull. *Laridæ.*
Skunk. *Mustelidæ.*
Sleeve fish.—A common name for the loligo.
Slipper plants. *Cypripedium.*
Sloth. *Bradypidæ.*
Slow worm.—Another name for the blind worm
Slug. *Limax.*
Smelts. *Salmonidæ.*
Smilacin.—The active principle of sarsaparilla. *Smilax.*
Smut.—A disease of the wheat plant, produced by minute fungi. *Thallogenæ.*
Snails. *Helicidæ.*
Snake root. *Polygalaceæ.*
— (Canada.) *Aristolochiaceæ.*
— (Virginia.) *Aristolochiaceæ.*
Snaps. *Elateridæ.*
Snipe. *Scolopacidæ.*
Snow-ball tree. *Viburnum.*
Snowberry. *Caprifoliaceæ.*
Snowberry tree. *Chiococco.*
Snow bunting. *Emberiza.*
Snowdrop. *Amaryllidaceæ* and *Galanthus.*
Snowdrop tree. *Halesia.*

Snow flake.—Same as snow bunting.
Snow tree. *Chionanthus.*
Soap berries. *Sapindaceæ.*
Soapstone. *Steatite.*
Soap-wort. *Caryophyllaceæ* and *Sapindaceæ.*
Solan goose. *Sula.*
Sole. *Pleuronectidæ.*
Solitary bees. *Andrena.*
Solitary wasps. *Eumenidæ.*
Solomon's seal. *Convallaria.*
Sora.—Another name for the spotted crake.
Sorrel. *Rumex.*
Souari nuts. *Rhizobolaceæ.*
Sour gourd.—Another name for the baobab.
Southern wood. *Artemisia.*
Sow bread. *Cyclamen.*
Sow thistle. *Sonchus.*
Soy. *Soja.*
Spanish broom. *Spartium.*
Spanish flies. *Cantharidæ.*
Sparrow. *Fringillinæ.*
Sparrow hawk. *Accipitrinæ.*
Spearmint. *Mentha.*
Spectre crabs. *Stomapoda.*
Speedwell. *Veronica.*
Spermaceti. *Catodontidæ.*
Spicewood. *Laurus.*
Spicula.—Fine pointed bodies, like needles.
Spider. *Aranеidæ* and *Arachnidæ.*
Spider crabs. *Maia.*
Spider monkey. *Ateles.*
Spider-wort. *Commelynaceæ.*
Spike lavender. *Lavandula.*
Spikenard. *Andropogon* and *Nardostachys.*
Spinage. *Chenopodiaceæ.*
Spindle shell. *Fusus.*
Spindle tree. *Celastraceæ.*
Spinnaret. *Arachnidæ.*
Spinous crab. *Crustacea.*
Spiny lobsters. *Macroura.*
Spiny-pouched rat. *Heteromys.*
Spirito-santo plant. *Orchidaceæ.*
Spleen-wort. *Asplenium.*
Sponge. *Spongiidæ.*
Sponge crabs. *Anomoura.*
Spoonbill. *Ardeidæ.*
Spotted crake. *Zapornia.*
Sprat. *Clupeidæ.*
Spring boc. *Antilopeæ.*
Spring-tails. *Podura.*
Spruce fir. *Abies.*
Spurges. *Euphorbiaceæ.*
Squills. *Scilla.*
Squirrels. *Sciuridæ.*
Squirting cucumber. *Ecbalium.*
Stag. *Cervina.*
Stag-beetle. *Lucanidæ.*
Staircase shell. *Solarium.*
Stalk-eyed crustacea. *Podopthalma.*
Star anise. *Illicium.*
Star apple. *Chrysophyllum.*
Starch. *Amylum.*
Star-fish. *Asteriadæ.*
Star-gazer. *Uranoscopidæ.*
Starling. *Sturnidæ.*
Star of Bethlehem. *Ornithogalum.*
Stavesacre. *Delphinium.*
Steinbock. *Capreæ.*
Stellerine.—The English name for the genus Rytina.
Sterrinck.—Another name for the sea leopard.
Sticklebacks. *Gasterosteus.*
Stilt birds.—Another name for the wading birds.
Stink-horns. *Phallus.*
Stock. *Cheiranthus.*
Stock-fish. *Gadidæ.*
Stocks. *Mathiola.*
Stone chat. *Saxicola.*
Stone crop. *Crassulaceæ.*
Stone curlew. *Charadriidæ.*
Stone lily. *Crinoideæ.*
Stone pine. *Pinus.*
Storax. *Styracaceæ.*
Stork. *Ardeidæ.*
Stormy petrel. *Procellarinæ.*
Stramonium. *Datura.*
Strawberry. *Fragaria.*
Strawberry tree—Is the Arbutus unedo.
Strawstone. *Karpholite.*
Strychnine.—The active principle of the nux vomica. *Strychnos.*
Sturgeon. *Sturionidæ.*
Style-wort. *Stylidium.*
Succory.—Another name for chicory.
Sucking-fish. *Echeneidæ.*
Sugar cane. *Saccharum.*
Sugar louse. *Lepisma.*
Sugar maple. *Acer.*
Sultana.—Another name for the porphyrio.
Sumach—Is a species of the genus rhus.
Sumatra camphor. *Camphora.*
Sun-birds. *Nectarinidæ.*
Sun dew. *Droseraceæ.*
Sun-fish. *Diodontidæ.*
Sunflower. *Helianthus.*
Sun hemp. *Hibiscus.*
Sunstone. *Felspar.*
Surmullet. *Mullus.*
Swallow hawks. *Milvina.*
Swallows. *Hirundinidæ.*
Swallows' nests. *Thallogenæ* and *Hirundinidæ.*
Swans. *Cygninæ.*
Sweet almond. *Amygdaleæ.*
Sweet bay laurel. *Lauraceæ.*
Sweet briar. *Rosa.*
Sweet potato. *Batatas.*
Sweet William. *Caryophyllaceæ.*
Swifts. *Hirundinidæ.*
Swine. *Suidæ.*
Sword-fish. *Scomberidæ.*
Sword tails. *Xiphosura.*
Sycamore. *Platanus.*
Synonym.—A word or name which has the same signification as another.
Syringa. *Philadelphaceæ.*

Tabasheer. *Bambusa.*
Table spar. *Wollastonite.*
Tacamahac.—A resin yielded by certain plants, as *Calophyllum calaba*, one of the gamboge family, and *Elaphrium tomentosum*, one of the amyris family. The resinous exudation from the buds of one or two of the poplar family is also known by the same name.
Tadpole. *Batrachia.*
Taguan. *Pteromys.*
Talipot palm. *Corypha.*
Tallow tree. *Stillingia.*
Tamandua. *Myrmecophaga.*
Tamarind tree. *Tamarindus.*
Tamarisk. *Tamarix.*
Tanagers. *Tanagrinæ.*
Tanghin poison. *Apocynaceæ.*
Tangle.—A sea-weed. *Thallogenæ.*
Tansy. *Tanacetum.*
Tape-worm. *Bothriocephalus* and *Tænia.*
Tapioca. *Jatropha.*
Taqua nut.—Same as vegetable ivory, *Phytelephas.*
Taraxacine. The active principle of the dandelion. *Leontodon.*
Tarentula. *Araneidæ.*
Tarragon.—A species of *Artemisia*, used in pickles and salads, and in the medication of vinegar.
Tartarean lamb. *Acrogenæ.*
Tasmanian wolf. *Dasyurinæ.*
Tea plant. *Thea.*
Tea plant of Paraguay. *Aquifoliaceæ.*
Teak tree. *Tectona.*
Teasel. *Dipsaceæ.*
Tecamahac.—Same as *Tacamahac.*
Teel seeds. *Bignoniaceæ.*
Teguexins. *Teidæ.*
Teledu.—A name given to the *Mydaus.*
Telescope-fly. *Diopsis.*
Tench. *Cyprinidæ.*
Tenrec. *Centetes.*
Tentacula.—The feelers or organs of touch of certain animals, as snails, &c.
Terns. *Laridæ.*
Terrapin. *Chelonia.*
Thallophyta (θαλλος, a frond; φυτον, a plant).—The same as *Thallogenæ.*
Theine.—The active principle of the tea plant. *Thea.*
Theobromine.—The active principle of cacao and chocolate. *Theobroma.*
Thick knees. *Charadriidæ.*
Thistle. *Carduus.*
Thorn apple. *Datura.*
Thorny oyster. *Spondylus.*
Thorough wax. *Eupatorium.*
Thread worm. *Filaria.*
Thrift.—A common name for the species of *Statice.*
Thrush. *Turdidæ.*
Thunder-fish.—A name given by the Arabs to the *Malapterurus electricus.*
Thyme. *Thymus.*
Ticks. *Acaridæ.*
Tiger. *Felinæ.*
Tiger-beetles. *Cicindelidæ.*
Tiger-cats. *Felinæ.*
Tiger-moth. *Arctiidæ.*
Titmice. *Paridæ.*
Toad. *Batrachia.*
Toad flax. *Linaria.*
Tobacco. *Nicotiana.*
Tobacco-pipe fish. *Fistularia.*
Todies. *Todus.*
Tomato. *Solanaceæ.*
Tonga bean. *Coumarouna.*
Toothache tree. *Araliaceæ* and *Xanthoxylaceæ.*
Tooth-wort. *Plumbaginaceæ.*
Toothed whales. *Catodontidæ.*
Tooth shells. *Dentalium.*
Tooth-wort. *Lathræa.*
Tope. *Squalidæ.*
Top shells. *Turbinidæ.*
Tormentil. *Potentilla.*
Torsk. *Brosmius* and *Gadidæ.*
Tortoise beetle. *Cassididæ.*
Tortoise plant. *Testudinaria.*
Tortoises. *Chelonia.*
Toucans. *Ramphastidæ.*
Tous les mois. *Canna.*
Tragacanth. *Astragalus.*
Traveller's joy. *Clematis.*
Treacle mustard. *Erysimum.*
Tree beard. *Bromeliaceæ.*
Tree creepers or True creepers. *Certhiadæ.*
Tree ferns. *Cyathea.*
Tree lily. *Hæmodoraceæ.*
Tree lobster. *Crustacea.*
Tree mallow. *Lavatera.*
Tree nettle. *Urticaceæ.*
Treefoil. *Trifolium.*
Trepang. *Holothuriidæ.*
Tripe-de-Roche. *Thallogenæ*
Troopials. *Cassicus.*
Tropic bird. *Phaeton.*
Trouts. *Salmonidæ.*
Truffle. *Thallogenæ.*
Trumpeter. *Psophia.*
Trumpet-flower. *Bignoniaceæ.*
Trumpet-flowered Jasmine. *Tecoma*
Trumpet shell. *Triton.*
Trumpet wood. *Artocarpaceæ.*
Trunk-fish. *Ostracion.*
Tuberose. *Polianthes.*
Tulip tree. *Liriodendron.*
Tunicaries. *Tunicata.*
Tunny. *Scomberidæ.*
Turbith. *Convolvulaceæ.*
Turbot. *Pleuronectidæ.*
Turkey. *Meleagris.*
Turkey buzzard. *Cathartes.*
Turmeric. *Curcuma.*
Turnip. *Brassica.*
Turnip fly. *Galerucidæ.*
Turnsole. *Heliotropium.*

Turnstone. *Charadriidæ.*
Turpentine. *Abies.*
Turpentine (Chian). *Anacardiacea*
Turtles. *Chelonia.*
Tussac grass. *Dactylis.*
Tutsan. *Hypericum.*
Type.—A general form, such as is common to the species of a genus, or the individuals of a species.
Tyrant shrikes. *Muscicapidæ.*
Tyrian purple. *Purpura.*

Ultramarine. *Lapis Lazuli.*
Umari. *Geoffroyia.*
Umbrella tree. *Thespesia.*
Umiri balsam. *Humirium.*
Unau.—A name given to the two-toed sloth. *Bradypidæ.*
Under-shrubs.—Small shrubs, the permanent woody stem in which does not exceed the length of the arm.
Urchins. *Erinaceus.*
Urchins (sea). *Echinidæ.*
Upas tree. *Artocarpaceæ.*
Upas tieuté *Strychnos.*

Valerian. *Valeriana.*
Valonia oak. *Quercus.*
Valve.—In general Zoology the term valve means a membranous partition within the cavity of a vessel, which opens to allow the passage of a fluid in one direction, and shuts to prevent its regurgitation. In Conchology, the term is applied to one of the pieces or divisions in bivalve and multivalve shells.
Vampyres. *Cheiroptera.*
Vanilla. *Orchidaceæ.*
Variety.—A subdivision of species founded on characters supposed not to be permanent.
Varnishes. *Anacardiaceæ.*
Vegetable ivory. *Phytelephas.*
Vegetable marrow. *Cucurbita.*
Vegetable tallow. *Vateria.*
Vegetable wax. *Coccidæ.*
Velani. *Quercus.*
Vendace. *Salmonidæ.*
Venus's fans. *Anthozoa.*
Venus's fly-trap. *Dionea.*
Veratria.—The active principle (an alkaloid) found in the white hellebore. *Veratrum.*
Verjuice.—A harsh, acid juice, contained in unripe grapes.
Vervain. *Verbenaceæ.*
Vetch. *Vicia.*
Vibratile.—When there is a constant oscillatory motion in any part.
Vicugna. *Lama.*
Vinegar plant. *Ulvina.*
Vine mildew. *Oidium.*
Vines. *Vitaceæ.*
Violet. *Violaceæ.*
Violet shells. *Janthina.*
Viper. *Viperidæ.*
Viper's bugloss. *Echium.*
Virginian snakeroot. *Aristolochiaceæ.*
Virgin's bower. *Clematis.*
Viscacha. *Chinchillidæ.*
Viscous.—Sticky, clammy, like birdlime.
Viviparous blenny. *Zoarces.*
Volcanic.—Implying the action of fire apparent at the surface, and thus contrasted with plutonic, which marks underground phenomena.
Vole. *Murina.*
Volute.—A spiral turn, as in shells &c.
Volutes. *Volutidæ.*
Vultures. *Vulturidæ.*

Wading birds. *Grallæ.*
Wagtails. *Motacillina.*
Walking leaves. *Phasmidæ* and *Orthoptera.*
Walking-sticks. *Orthoptera* and *Phasmidæ.*
Wallflower. *Cheiranthus.*
Walnut. *Juglandaceæ.*
Walrus. *Phocidæ.*
Wampum. *Veneridæ.*
Wapiti. *Cervina.*
Warblers. *Sylvinæ.*
Wart hog. *Phacochœrus.*
Wasps. *Vespidæ.*
Water bean family. *Nelumbiaceæ.*
Water bears. *Tardigrada.*
Water bug. *Naucoris.*
Water caltrops. *Trapa.*
Water chestnut. *Trapa.*
Water cress. *Nasturtium.*
Water flannel.—A species of conferva which forms beds of entangled filaments on the surface of water.
Water flea. *Cyclopidæ* and *Daphnia.*
Water hemlock. *Cicuta* and *Oenanthe.*
Water hen. *Rallidæ.*
Watering-pot shell. *Aspergillum.*
Water lemon. *Passiflora.*
Water lily. *Nymphæa.*
Water melon. *Cucumis.*
Water mole. *Scalops.*
Water ouzel. *Hydrobata.*
Water pepper. *Elatinaceæ* and *Polygonaceæ.*
Water pitcher. *Sarraceniaceæ.*
Water scorpion. *Nepa.*
Water wagtail. *Motacillinæ.*
Wattle.—The fleshy excrescence which grows under the throat of some fowls, as the turkey, &c.
Wattle bird. *Anthochœra.*
Waxbills. *Fringillinæ.*
Wax flower. *Asclepiadaceæ.*
Wax myrtle. *Myricæ.*
Wax palm. *Ceroxylon.*
Wax plant. *Hoya.*
Wax-wing. *Ampelidæ.*
Way-bred. *Plantaginaceæ.*
Wayfaring tree. *Viburnum.*

Weasels. *Mustelidæ.*
Weavers. *Ploceinæ.*
Weeping willow. *Salix.*
Weevils. *Curculionidæ.*
Wentle-trap. *Scalaria.*
Whales. *Balænidæ.*
Wheat. *Triticum.*
Wheat ear. *Saxicola.*
Wheel animalcules. *Rotatoria.*
Whelk. *Buccinum.*
Whidah finch. *Ploceinæ.*
Whin chat. *Saxicola.*
Whins. *Ulex.*
Whip-poor-Will. *Caprimulgidæ.*
Whirligigs, or whirlwigs. *Gyrinidæ.*
White ants. *Termitidæ.*
White-bait. *Clupeidæ.*
White fish. *Salmonidæ.*
White horehound. *Marrubium.*
Whiting. *Gadidæ.*
Whitestone. *Leptynite.*
White whale. *Delphinidæ.*
Whortleberry. *Vaccinium.*
Widow bird. *Ploceinæ.*
Wild boar. *Suidæ.*
Wild chamomile. *Matricaria.*
Wild liquorice. *Ononis.*
Willow herbs. *Epilobium.*
Willow trees. *Salix.*
Wind flower. *Anemone.*
Wing shells. *Aviculidæ.*
Winter cherry. *Physalis.*
Winter-green. *Pyrola.*
Winter's bark. *Winteraceæ.*
Wire worm. *Elateridæ.*
Woad. *Isatis.*
Wolf. *Canina.*
Wolverene. *Gulo*
Wombat. *Macropidæ.*
Woodbine. *Caprifoliaceæ.*
Woodcock. *Scolopacidæ.*
Wood germander. *Teucrium*
Wood lice. *Isopoda.*
Woodpeckers. *Picidæ.*
Wood sorrel. *Oxalidaceæ.*
Wood swallow. *Artamus.*
Wood wasps. *Crabronidæ.*
Wool trees. *Eriodendron.*
Woorali poison. *Strychnos.*
Worbles. *Œstridæ.*
Worms. *Annelida.*
Worm shell. *Vermetus.*
Wormwood. *Artemisia.*
Wow-wow. *Hylobates.*
Wrasse *Julis* and *Labridæ.*
Wren. *Troglodytes.*
Wryneck. *Yunx.*
Wych-elm. *Ulmaceæ.*

YACARE. *Crocodilidæ.*
Yak. *Boveæ.*
Yams. *Dioscoreaceæ.*
Yellow root. *Xanthorhiza.*
Yellow water lily. *Nuphar.*
Yew tree. *Taxaceæ.*

ZABUCAJO NUTS.—The same as Sapucaya nuts.
Zebra. *Equidæ.*
Zebra wood. *Connaraceæ.*
Zeolite.—A particular kind of mineral which contains water, and on this account swells up under the blowpipe. In mineral acids zeolite becomes gelatinous.

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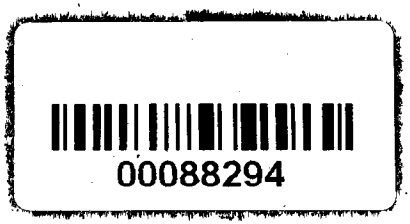
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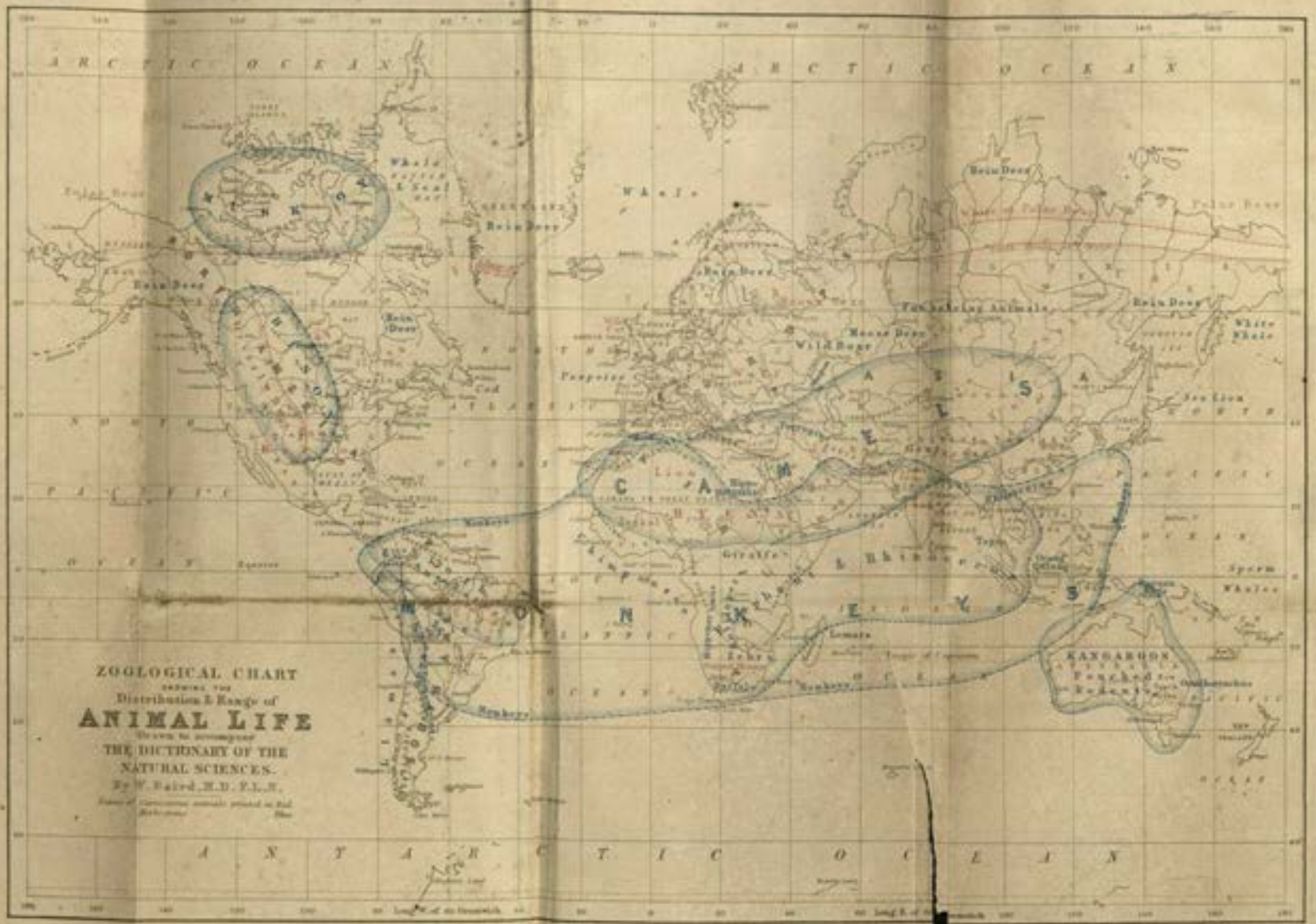
ZOOLOGICAL CHART
Distribution & Range of
ANIMAL LIFE
THE DICTIONARY OF THE
NATURAL SCIENCES.
ARCTIC OCEAN
ANTARCTIC OCEAN
Whale
Rein Deer
Polar Bear
Fur-bearing Animals
Moose Deer
Wild Boar
White Whale
Sea Lion
Sperm Whales
Porpoise
Cod
Monkeys
Giraffe
Lemurs
Zebra
Tropic of Capricorn
KANGAROOS
Pouched Rodents
Ornithorhynchus
CAMELS
MONKEYS
ASIA

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